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The Pre-Adolescent Mood Scale: Development and Validation

by

© Kar-La' Schokman-Gates

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
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External Examiner

Date May 7, 1984

DEDICATION

To Dr. Hugh M. Petersen, who served as my mentor during the undergraduate years, and provided me with the encouragement and self-confidence to pursue the graduate degrees; he realized, even then, that I would be happy with nothing less.

ABSTRACT

Due to the many problems inherent to personality measurement in children, there has been a dearth of scientific interest as far as child mood states are concerned. In order to rectify this situation, research was undertaken for the construction and validation of an age-appropriate mood instrument.

Prior research, using factor analysis on data from 594 pre-adolescents (Schokman-Gates, 1981), had indicated the presence of four invariant mood dimensions across age and gender. These dimensions of **Surgency**, **Sadness**, **Aggression**, and **Mastey/Self-Esteem** were found to have been the most reliable across the different age groups and genders, having at least five marker items in common for all groups on each factor. Accordingly, the **Pre-Adolescent Mood Scale** was constructed on the basis of these four factors, with a reduction of each dimension to its five most robust items, as determined by intra-factor correlations and marker loadings. Further, because this measure was believed to be potentially useful in school, as well as clinical and research settings, the actual test format took into account the issues of "reactive effects" and time required for administration and scoring. The result was a 20-item mood adjective checklist which was presented as an "activity" rather than a "test", and which employed a fairly engaging answer format.

Reserach regarding the validity of this new instrument included the use of both factor analytic and analysis of variance techniques, undertaken on 947 preadolescents, who represented two separate population bases (urban vs rural) Employing two different repeated measures designs, the 12 treatment conditions involved both manipulative (exam vs film) and environmental (school color/light) settings.

Hypotheses regarding the structure, state dimensionality, and factor invariance of the scale were confirmed for both the rural and urban samples. Moreover, the two criterion-related validation studies indicated that the scale was sensitive to the mood effects of age, gender, diurnal variation, and environmental/situational conditions.

These findings were discussed in reference to the construct and criterion-related validity of the instrument, as well as in terms of replicability across gender, grade, and population base. Furthermore, possible implications regarding the detrimental/beneficial mood effects of the school's physical environment were

broached, as were several other areas which were hitherto impossible to objectively investigate.

Based on the above findings, it was concluded that "the Pre-Adolescent Mood Scale is a valid and internally-reliable state measure, which has been found to have great utility for assessing the mood effects induced by both situational and environmental contingencies".

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I. INTRODUCTION

The state of one's mood at any given time has long been associated with the occurrence of certain behavioral probabilities (e.g., Kantor, 1923; Nowlis & Nowlis, 1956; Pribram, 1970; Ryle, 1950; Skinner, 1957; and Wyatt, 1932), nonetheless, it was not until the early 1950's that any thoroughgoing study of this introspective area was attempted (Nowlis, 1961 & 1970). From that time forward, a virtual flurry of activity has transpired, with literally hundreds of investigations being reported (see Howarth & Schokman-Gates, 1981, for a comprehensive review of the literature). In fact, the study of mood or emotion now appears to be the current Zeitgeist in the area of personality, with researchers such as Izard, Lorr, Plutchik, Russell and Mehrabian, and Zuckerman heading the vanguard. With such a renewed interest in the field, one would hope that some attention was also being given to childhood mood states.

Several investigators, in fact, have recently been involved in this area (e.g., Lewis & Michalson, 1982 & 1983; Tennes & Mason, 1982), nonetheless, their interests lie mainly with infants and toddlers, using physiological reactions or behavioral ratings as mood indicators. Few attempts have been made to tap the subjective experience of the child, with the exception of state-trait anxiety (e.g., Castaneda, McCandless, & Palermo, 1956; Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960; and Spielberger, 1970). But, here too, researchers are forced to conclude "that despite the significances which are attributed to anxiety in the development of the child, systematic research [into its affective state] is practically nonexistent" (Sarason et al., 1960, p. 81).

Likewise, researchers such as Yarrow (1979), note that just as with an adult, the child's mood state may have a very profound affect on his interactions with the environment: "Feelings may facilitate or interfere with learning; they may enhance attention to stimuli or they may bias perception and distort interpretation of events. When a child is joyful, he or she is likely to be aware of different aspects of a situation and interpret it differently than when angry" (p. 953). Yarrow then goes on to emphasize the need for specific mood measuring techniques in order to delineate the important roles which emotions play in child development.

In a similar vein, Sarason et al. (1960) and

Spielberger, Anton, & Bedell (1976) have noted the deleterious effects of negative mood state on the child's classroom performance, while Izard (1964 & 1965) has found positive affect to be significantly associated with enhanced intellective functioning, and greater receptivity to the environment. Such findings would appear to have considerable relevance for the school situation, not to mention that of the child's developing self-esteem (e.g., Coopersmith, 1968; Gelfand, 1962; Yarrow, 1979), and yet, no systematic studies of this area have been undertaken because there are no appropriate[1] state measures.

Perhaps a primary reason for the dearth of scientific concern in this field rests on the fact that the researchers would be dealing with immature subjects who bring an additional set of problems to the area of mood measurement:

> In the first place, one does not want errors from complications in the purely cognitive field while exploring the personality field. With children there are problems of reading and verbal understanding that might force one to forego due representation of certain areas of behavior.... Moreover, if the self-perceptions of children--

> quite apart from language difficulties--should prove to be naive and unstable, it would be a poor place to start trying to define elusive basic structure....Because of these considerations the best strategy has seemed to start with adults and work down. This approach also gives the advantage that the personality sphere can include markers for the adult factors so deliberately and gradually modified for children that a continuity of variables might be established (Cattell, 1973, p. 65).

By taking careful note of these child-induced complications, then, one should be able to construct a valid mood instrument capable of tapping the subjective feeling states of pre-adolescents (7 - 12 years old). Accordingly, my Master's thesis (Schokman-Gates, 1981) was the first step in this direction. It provided evidence that from an original 447-item list of adult mood markers, 81 were found by the children to be comprehensible and have state-descriptive meaning. As a second step, my doctoral research was aimed at developing a pre-adolescent mood scale based on these markers, and at providing the necessary test validation.

Note for Chapter I

1. Until very recently, the only objective measures of mood that have been used with children have been the adult forms of the mood adjective checklist. Such usage implied that state structure in children was identical to that of the adults, as well as assuming that the mood-descriptive items had similar comprehensibility and connotative levels for both groups. As Lira, White, and Finch (1977) noted, even some adolescents found these adjectives to have very little meaning in regard to their fluctuating levels of mood state, with in fact, "a number of the adjectives [being] absent from the lexicon of this population" (p. 535). Results such as this indicated the need for an age-appropriate multiple mood instrument. Kotsch, Gerbing, and Schwartz (1982) believe that they have found it, however, as will be discussed in Chapter II, the DES III suffers from the same problem.

II. REVIEW OF RELEVANT LITERATURE

As previously noted, there are literally hundreds of studies pertaining to mood states in the adult, with relatively few pertaining to those in the child. Nonetheless, because I am specifically concerned with mood measurement, and self-report at that, I will confine my remarks to three main areas: 1) mood theories and definitions; 2) self-report mood measurement; and 3) child state instruments.

A. Mood Theories and Definitions

Prior to the early 1950's, "mood" had either been cursorily equated with such terms as "emotion", "affections", "feelings", "attitudes", and "passions" (Lange & James, 1922; Warren, 1934), or relegated to the "rubbish heap" by those within the Behaviorist movement (Watson, 1928). Thus, attempts to define this "ethereal" term by those few individuals who bucked the objective Behaviorism Zeitgeist, resulted in often contradictory results. Such affective words as those noted above have been variously defined as representing anything from "feeling reactions consisting mainly of a simple type of slightly organized conduct" (Kantor, 1923, p. 461), or "an enduring but not permanent emotional attitude" (Warren, 1934, p. 170), to "a temporary disposition toward a broad set of behavioral and private or subjective events" (Nowlis, 1970, p. 264).

Even today, one finds this construct to be within a state of conceptual limbo, due to its often unscientific or idiosyncratic usages (Ewert, 1970; Ketai, 1975; Owens & Maxmen, 1979):

> When scanning our common vocabulary for moods, we detect that it covers a very broad field of mental states. The mood attributes refer by no means only to pleasure-unpleasure qualities, or to high or low level of mood. They are not even restricted by feeling qualities, but may point to ideational or also to such functional and behavioral aspects as predominate in the mood manifestations. For example, we may be either in a dull, uninspired, in an alert, a creative, or in a contemplative, thoughtful, philosophical mood (Jacobsen, 1957, pp. 76-77).

Such broadly-descriptive referents as these, however "true-to-life" they may appear, do not help in bringing us any closer to a definition which may prove of value in the personality sphere--for in order to quantitatively study this ephemeral construct, we must first operationally define it. What is needed, then, is a more focussed view which attempts to relate these "mental states" to the behavior of the individual. Only then can we hope to develop and use valid mood instruments.

Consummate presentations of the extant mood theories have been provided in Plutchik (1980a) and Plutchik and Kellerman (1980), thus, only three conceptualizations, each coming from a different tradition, will be reviewed here.[1] Additionally, it should be noted that most researchers, irrespective of their philosophical affiliation, recognize that mood/emotion is a complex concept consisting of physiological, phenomenological, and behavioral components (Izard, 1979); what distinguishes them from one another, then, is the differential emphasis they choose to place on the three components (Plutchik, 1980a).

Physiological Tradition

Izard (1965) stated that affect or mood "is a major personality subsystem" which acts as a function of the neuro-physiological changes produced by either internal (e.g., cognitive, hormonal) or external stimulation.

Each affect is assumed to have a neurological basis in subcortical "programs", and hence, is genetically determined. Nonetheless, mood is also conceived of as having self-generating motivational properties (in fact, it is the primary motivational system) which may both be affected by and produce effects in the behavior of the individual: Positive affect states produced by these neuro-physiological programs lead to integrative behavior and effective functioning, which in turn enhance the mood system; negative affects produce discordance among the other personality subsystems, and thereby diminish the quality of behavior. Thus, Izard's formulation maintains that mood state is the primary motivational variable for behavior, and that, as such, behavior will be altered only if cognitive data produces an alteration in the relevant affect within that mood state.

Other theoreticians in this area run the gamut from those interested in general autonomic arousal (e.g. Solomon, 1977; Wenger, 1956: Young, 1961 & 1967), to those whose main concern is with integrated brain function (e.g., Arnold, 1960 & 1970; MacLean, 1975 & 1978; Pribram, 1967a,b & 1970). All, however, see mood/emotion as being, first and foremost, dependent on physiological reactions to the environment, be it internal or external.

Psychological (Cognitive/Ethological) Tradition

Although Plutchik's theory (1980 a,b,c,d) clearly falls within the cognitive/ethological realm, he prefers that his conceptualization be regarded as one of psychoevolutionary relevance. And perhaps it is, for his theory actually represents an attempt at synthesizing the different concerns of the three main traditions:

> [A mood or]^2 emotion is an inferred complex sequence of reactions to a stimulus, and includes cognitive evaluations, subjective changes, autonomic and neural arousal, impulses to action, and behavior designed to have an effect upon the stimulus that initiated the complex sequence. (Plutchik, 1980a, p. 361).

Further elaboration of this basic mood definition includes the specification of eight primary emotions. These are seen as being polar opposites--fear - anger, joy - sadness, acceptance - disgust, and anticipation - surprise--with each emotion (subjective feeling) having a unique set of components. For example, a stimulus event categorized within Plutchik's theory as a threat (to adaptation/survival needs) would usually lead to a cognitive evaluation of danger, a subjective feeling of fear, an autonomic response of rapid heartbeat, a motor impulse of tensing to run, and the actual behavior of running. Moreover, these complex emotional sequences are believed to serve two evolutionary purposes: If properly carried to completion, without a breakdown or miscuing in any of the links, the result will be 1) adaptive, and therefore "survival-oriented"; and 2) serve as a social signal to indicate the motivation or intent of the actor, and hence, again be "survival-oriented".

Clearly, Plutchik's conceptualization is the most formalized of any of the extant theories. In addition it possesses a considerable amount of empirical support, including data gathered from specially constructed mood measures (e.g., Plutchik's Mood Profile Index, 1966)[3]. Nonetheless, and perhaps due to the formidable nature of his cognitive/ethological theory, it has not generated the research interest one would expect. This might be explained by the fact that within the larger Zeitgeist of mood study, the current trend is towards the area of cognitive mood theory, with many individuals proposing their own conceptualizations regarding cognition and its role in mood state.

Within this "mini-area" may be found individuals with widely-varying backgrounds, such as Groen (1975), Levi (1967) and Rioch (1975) from the physiological realm, or Beck (Burns & Beck, 1978), Lang (1968), Lazarus (1975; Lazarus, et al., 1980), and Meichenbaum (1972, 1975; Meichenbaum & Butler, 1980) from the clinical. Others include personality researchers such as Averill (1980), Edmunds and Kendrick (1980), Epstein (1982), and Wessman (1979). Irrespective of their orientation, however, all view cognition (evaluation) as being of prime importance to the induction, maintenance, and alteration of a mood state. For, as Plutchik (1980a) maintained, "the existence of any emotion presupposes the prior occurrence of an evaluation....evaluations are concerned with whether a stimulus is good or bad, beneficial or harmful....{with} there {being} a limited number needed for survival....{hence} these evaluations and their many combinations lead to the large variety of emotional responses that are actually observed (p.288)--cognitions are in the service of emotions" (p. 295). It is hoped that such a cognitive trend in mood research will also bode the return of psyche to psychology--where it rightfully belongs.

Behavioral Tradition

The third conceptualization to be discussed is that of Vincent Nowlis--the "father" of modern-day mood measurement. His Mood Adjective Checklist (Nowlis & Nowlis, 1956; reviewed in Lake, Miles, and Earle, 1973) has served as the proto-type for numerous state instruments, and is often given reference credit (e.g., Hendrick & Lilly, 1970; Hornstein et al., 1975; Reimanis, 1974; Silver, 1973 & 1974). Hence, because of his research interests, Nowlis' formulation (1961) focuses more on the "semantic explication...of this complex popular term", in order to provide a lucid operational definition for use in mood studies. In so doing, he has also attempted an integration of the linguistic, behavioral, and psychoanalytic viewpoints regarding this important area of personality (Nowlis, 1963 & 1977). Accordingly, Nowlis has posited the following eight tenets:

1) Mood is a dispositional concept [which implies tendencies toward behavior];

2) mood is a temporary or reversible disposition, lasting minutes, hours, or days [as in a manic-depressive cycle];

3) within such intervals, mood involves some constancies in behavior and experience (which may or may not be unique to the individual);

4) mood involves some constraint on behavior and experience (since each mood factor is seen as a tendency toward certain behaviors);

5) mood involves the whole person (since it includes feedback from the general functioning of the individual);

6) mood may be estimated on the basis of indices which are otherwise trivial (e.g., by self-avowal using adjective descriptors, or by noting postural changes);

7) the classification of mood terms involves more than one major category (since one's mood state involves many mood components);

(and)

8) the heterogeneous determinants of mood may be relatively remote, obscure, (idiosyncratic), or though obvious, like the weather, may be relatively inaccessible to manipulative control.

(Nowlis, 1961, p. 374).

Based on the above tenets then, Nowlis purported that the concept of mood, as well as its accurate assessment, is vitally important to understanding the organization and prediction of an individual's behavior (Nowlis, 1965).

Moreover, he was able to provide a fairly comprehensive definition of this rather elusive concept: "(mood is) an intervening variable or predispositional factor that is the source of information, or disseminable stimuli to the organism about the current functioning characteristics of the organism. Conscious mood consists of the perceptual and cognitive responses to this information" (Nowlis & Nowlis, 1956, p. 352).[4] Thus, "mood refers to the effect on the self of its own configurations of activity" (Nowlis, 1963, p. 74), and is considered to be a flexible dispositional concept (even though it does depend upon some constancies in behavior and experience) which involves the whole person, and which "may be estimated on the basis of indices which are otherwise trivial" (Nowlis, 1961, p. 374).

Other individuals within this tradition, such as Millenson (1967) and Ryle (1950)[5] place even greater emphasis on behavior and activity: mood "alludes to actual behavior...it conjointly explains what is actually going on and authorizes predictions of what will go on, 'if' (such and such happens)...a person's mood during a given period colors all or most of his actions and reactions during that period. His work and his play, his talk and his grimaces, his appetites and his daydreams, all reflect his touchiness, his joviality or his depression. Any one of them may serve as a barometer for all the others" (Ryle, 1950, pp. 97-99). However, such behavioral researchers as Millenson are not interested in measuring how an individual's subjective state colors his behavioral state. That is left to the area of psychometrics, and such researchers as Raymond B. Cattell.

Behavior and Mood Measurement

Cattell, who has long worked in the area of mood and personality, noted that any taxonomy of behavioral patterns must encompass not only traits, but also states. In fact, "in the prediction of behavior, knowing whether a person is in a good or bad mood or angry or amorous may well be more useful than knowing his particular trait scores" (1973, p. 13).

Evidence that this is actually the case in some instances, was found in a series of studies reviewed by Zuckerman (1976). These investigations ran the gamut from mood effects on hypnotizability (Neary, 1975;

Zuckerman, Bone, Neary, Mangelsdorff, & Brustman, 1972; Zuckerman, Persky, & Link, 1967b) and interpersonal attraction (Gouax, Lamberth, & Friedrich, 1972), to emotional reactions before and after surgery (Spielberger, Auerbach, Wadsworth, Dunn, & Taulbee, 1973; Auerbach, 1973) and to experimental visual and auditory stimuli (Neary & Zuckerman, 1976). Taken together, the results suggested that the mood measure given just prior to the situation of interest (whether naturalistic or experimental) was a better predictor of subject behavior to the condition than was a general trait measure.

Other researchers have indicated that one's mood state often has profound affects on cognition and action, and vice versa (e.g., Gorman & Wessman, 1974; Izard, 1965; Jones & Thelen, 1978; Nowlis & Nowlis, 1956; Plutchik, 1980a; Tomkins, 1965). In fact, "it is becoming increasingly clear that affect plays a critical part in initiating, maintaining, and regulating man's environmental encounters....An individual's mood at a particular moment establishes the whole nature of his relationships with the world. In one mood he perceives and encounters different things from those he does in another mood" (Wessman & Ricks, 1966, pp. 3 & 17).

Consequently, Fiske (1971) has cautioned that in setting up any type of research program which looks at behavioral responses, attention should be paid to both specifying the effects of state on the construct, and to taking into account the subject's present mood level--and the only way to do that is through objective measurement of these subjective states.

Considering its potential significance to the personality realm, it is little wonder that mood measurement research is finally being conducted in a serious vein, with hundreds of studies having been undertaken during the past decade (Howarth & Schokman-Gates, 1981). And, prominent among these studies, are those which have found the possible confounding of trait measurement with that of state: Cattell (1973) provides evidence for the assertion "that what are now measured as traits may prove to be mixtures of traits and states" (p. 189), while Spielberger (Spielberger et al., 1976) and Zuckerman suggest that traits may be defined by the mean and variance of the subject's measured states--that is, an individual's "trait" may actually be a subjective averaging of her/his prior "states" (Zuckerman, 1976; Zuckerman, Persky, & Link, 1967b). Further, Plutchik (1980a) provides evidence that basic emotions and personality traits are essentially the same, since "we tend to judge an individual's traits on the basis of repeated evidence of certain emotional reactions....a trait is simply a tendency or disposition to react to interpersonal situations with certain consistent emotional reactions" (p. 173).

Clearly, such findings must have important implications for the understanding of personality dynamics, since the variety of personality traits "may in large measure be a consequence of the unlimited possibilities for differential investment of all the affects" (Wessman & Ricks, 1966, p. 5). Thus, personality dynamics may actually be affective dynamics, and, as such, it merits a more veridical assessment than can be provided by the trait measures. To correct this condition, a number of researchers have developed both specialized and more general mood assessment intruments. The vast majority of these, however, are adult measures; there is presently available no mood instrument which specifically takes into account the comprehensibility level of pre-adolescents.

B. Self-Report Mood Measurement

Salzman, Kochansky, Shader, and Cronin (1972) found there to be almost 40 "self" and "other"[6] mood rating scales which have proven of use in psychotropic drug studies, while Howarth and Schokman-Gates (1981) provided a fairly comprehensive review of 11 of the most widely-used self-report mood instruments. Notwithstanding this rather large number of affect measures, few state scales have attained the wide usage and acceptance of the leading trait scales or projective instruments: Buros (1978) indicated that among the personality measures which had accumulated over one hundred research citations each, only two state measures--Spielberger's STAI (Spielberger, Gorsuch, & Lushene, 1970) and the Zuckerman-Lubin MAACL (1965)--were to be found.

Perhaps one reason for this dearth in the scientific literature, is the very accommodating nature of the mood construct, for as Nowlis noted "(feelings) that apply to the self are (not only) useful but they are so important in practical psychology that literally hundreds of adjectives are applied to them. Scores based on various clusters of these adjectives form tentative indices of mood" (1961, p. 375). Thus, many researchers rely on ad hoc mood instruments[7] which they conveniently tailor by the careful selection of mood adjective descriptors; these measures may be used only once or twice, and then discarded in favor of still other ad hoc instruments believed to be "more suited" to the newest research interest. And yet, in dealing with any type of construct, isn't it first necessary to provide an explication of its delimiters, especially when the construct may have such variable patterns as those believed present in mood states?

Cattell (1972) addressed this very issue when he complained about the proliferation of state instruments, and the frequent absence of multivariate techniques in the construction of such instruments. In his view, the multivariate approach does not obviate the bivariate, but rather, it is "a necessary condition for effective bivariate experiment and is a precondition for adequate operational definition" (Howarth & Cattell, 1973, p. 794). What this implies is that the multivariate approach should be used at an early, rather than at a late stage of test development. Only then can the operational definition be based upon the actual pattern of relationships among the data, instead of upon merely a common sense basis. "The discovery of the number and nature of such response patterns...must precede location and listing of the internal and external stimuli that trigger them" (Cattell, 1966, p. 226), in order to adequately capture the basic structure present in human personality. In other words, the researcher needs to know what it is he intends to measure, before an appropriate test can be developed for its measurement. One prime method for doing so is through the use of factor analysis.

The chief proponent of this method in the state realm is Dr. Vincent Nowlis, who, after developing his prototypical self-report mood measure (Nowlis & Nowlis, 1956), also collaborated on the first intensive factor analysis of state dimensions (Green & Nowlis, 1957; Nowlis & Green, 1965). Others having undertaken this multivariate approach to mood investigation are Borgatta (1961), Gorman and Wessman (1974), Hendrick and Lilly (1970), Howarth (1977 & 1979), Lebo and Nesselroade (1978), Lorr, Daston, and Smith (1967), Lorr and Shea (1979), McNair and Lorr (1964) and Droppelman (1971,a,b), Russell and Mehrabian (1977), and Schokman-Gates (1981)[8] to name but a few. Their research interests, as well as those of other investigators, have spanned the gamut from the realm of the physiologist (e.g., Brown & Heninger, 1976; Stoyva &

Kamiya, 1968) to those of the behaviorist/clinician (e.g., Gatchel, Paulus, & Maples, 1975; Gilbert, Parker, & Claiborn, 1978; Haskell, Pugatch, & McNair, 1969; Mercatoris, Wilcoxon-Craighead, Craighead, & Schrader (1979); and even the environmental engineer (e.g., Gerst & Sweetwood, 1973). Clearly, Cattell's enjoiner is being seriously considered among the mood researchers, even though a few still adhere to the purely empirical form of mood test construction (e.g., Spielberger, 1970; Zuckerman, 1976).[9]

Although this present survey is but a brief overview of the current state of the field, the impact of self-report mood measurement upon the area of personality can in no way be termed meager. As we have seen above, moods permeate all that one thinks and does. One is different in every mood, since these states "are basic expressions of the individual's continuing total life condition, (which) reflect and influence changes in his ongoing involvements" (Wessman & Ricks,1966, p. 22). Such dominant mood patterns as can be determined (as well as the conditions and nature of their changes), must then be of basic relevance to the study of humankind. Nevertheless, this appears to be an area of research which has been sadly neglected in the field of child psychology.

C. Child State Instruments

Although there have been various instruments devised for trait measurement in the pre-adolescent group,[10] few considerations have been given to the state aspect of personality,[11] with the possible exception of Spielberger's State-Trait Anxiety Inventory for Children (Spielberger, Edwards, Lushene, Montuori, & Platzek, 1973). Nonetheless, this instrument is found to pose several problems when used for measuring mood states in children:

1) Because it is a combined state-trait measure purporting to assess but one emotional response (that of anxiety) it offers no utility for multiple-mood measurement--for Child is not a creature of anxiety alone! and

2) As a downward extension of Spielberger's adult inventory (Spielberger, Gorsuch, & Lushene, 1970), it too may share the fault of being a stress and depression measure, rather than one of trait and state anxiety (Cattell, 1973; Endler, 1978). Further evidence that this is actually the case was provided by my Master's research where a comparison of STAIC variables (Spielberger, 1970) with my marker variables indicated

that "out of the 20 items which comprise this single-state measure, eight are found to be marker variables for five of the pre-adolescent mood factors" (Schokman-Gates, 1981, pp. 90-91). Such findings would suggest a certain degree of non-homogenity for this "anxiety" scale, for if the STAIC items did indeed measure the single state of anxiety, one would expect them to congregate at one (or at the most, two) dimensions; their dispersal, however, was wide-spread, encompassing all factors save that of Mastery/Self-Esteem[12]. Looking at the results obtained for both Spielberger's STAIC and Zuckerman's MAACL (see note 9 at the end of this chapter), one wonders whether their sole use of the empirical method for test construction was adequate. Perhaps they would have obtained a more veridical and comprehensive set of guidelines by employing the joint use of empirical and analytical methods. Since further attention will be accorded this matter in the rationale chapter to follow, we will now return to the issue of child mood instruments.

At the time I began investigating pre-adolescent mood states, the only measure which could even be considered a child state instrument was the above-noted

State-Trait Anxiety Inventory for Children. Nevertheless, following the completion of my Master's thesis, information was published regarding several childhood mood measures (Kotsch, Gerbing, & Schwartz, 1982; Lewis & Michalson, 1982). Of particular interest to me was the recent addition to the area of mood measurement provided by Children's Emotions and Moods (Lewis & Michalson, 1983). Their impressive work--including the development of the Socioemotional Scales--is limited, however, by the fact that the measure applies only to infants and toddlers (ages 3 - 30 months). Clearly, it cannot be considered an instrument useful for assessing all age ranges of children, as their book title implies. Nonetheless, Lewis and Michalson are not alone in neglecting to be more specific in regards to the age level of interest. Quite a few childhood measures tend to use the term "child" or "children" when they in actuality refer to only a select sample from that population[13]. Others, such as those child measures reviewed by Plutchik (1980a), give the impression that they are mood scales, when in fact they are behavior-rating scales. As he noted in his presentation, "the fact that young children cannot be expected to clearly articulate their feelings has led developmental psychologists to rely heavily on behavior rating scales to evaluate emotions in children" (Plutchik, 1980a, p. 225). And yet, while such an explanation for the employment of "other" rating scales may be perfectly legitimate with the younger age ranges, my Master's research has indicated that pre-adolescents can indeed articulate their feeling states.

Notwithstanding the above findings, when one does attempt to quantify such introspective conditions through self-report instruments, it is vitally important to remember that pre-adolescents do not possess the verbal comprehension level of the adult. Moreover, the frequency of use and connotative meanings of mood state descriptors may actually differ between these two age groups (Schokman-Gates, 1981). Hence, one cannot merely take a "proven" adult measure, add further synonyms or word explanations, and then believe it to be appropriate for pre-adolescents. And yet, that's exactly what happened in the developmental stages of the only other pre-adolescent self-report mood measure--the DESIII (Differential Emotions Scale as adapted for Children and Adolescents; Kotsch, Gerbing, and Schwartz, 1982). Moreover, their initial study into this child-adapted scale involved factor analysis of the combined DES and

DESIII responses given by 206 college students!

Methodologically, there are two main problems with such a study: data analysis and subject selection. By including all items from both measures, the correlation matrix upon which the dimensions were based was altered, and therefore the basic factor structure obtained may have been greatly affected (no information regarding the factor matrix was given). If they had wished to provide evidence for a direct cross-adaptation of the DES, the more legitimate measure would have been a factor congruence program run on the loadings of each mood instrument. Nevertheless, however appropriate or inappropriate their data analysis may have been is of little concern to me in relation to the very strong reservations I have regarding their subject sample.

To have used adult subjects in order to assess the utility of a child-adapted measure appears to be very strange indeed, especially when they conclude from the results "that the DES and DESIII are equivalent measures of the fundamental emotions for individuals who comprehend the meanings of the DES items" (p. 261). It's nice to know that they have equivalent forms for an adult mood measure, but what about that for the child? Furthermore, by stating "that the new DESIII items provide a good measure of the fundamental emotions as measured by the DES" (p. 261), they are suggesting that pre-adolescent and adolescent mood states must be of the same nature and intensity as adult emotions. Based as it is on Izard's facial expression theory (1971), such an assumption is quite understandable, but is it veridical? No attempts at all were made to determine just what self-reported moods were actually present in the younger subjects. Even when they did do research with children, it consisted of two studies--one with 11- to 17-year olds, and one with 8- to 12-year olds--which provided evidence that their child-adapted measure was not tapping the same states as the adult instrument: less dimensions emerged due to the collapse of several factors, with considerably greater cross-loadings being evident, especially in the pre-adolescent group.

Such findings would indicate that the mood instrument under investigation was not comprised of independent scales, but rather consisted of a group of items which might better be interpreted as representing general negative- versus positive-affect[14]. And yet, the researchers conclude that "the validity of the 10 distinct emotions that are measured by the 10 corresponding groups of DESIII items has been supported for three different data sets...{with} the psychological meaning of the items {being} essentially the same for our 8-year-olds as it was for our 17-year-olds" (Kotsch, Gerbing, & Schwartz, 1982, pp. 276-277).

Further, it is of interest to note that test reliability research on another mood measure--the Zuckerman-Lubin MAACL (1965)--indicates a lack of concordance between the purported scales and those actually found: Pankratz, Glaudin and Goodmonson (1972) reported that the three MAACL scales of depression, anxiety, and hostility, were in fact, one scale, best represented by the summed score of all three, and measuring a general dimension of negative affect. This finding parallels my interpretation of the DESIII when used with pre-adolescents, since it too was found to be a general mood measure; due to its item content, however, both negative and positive affects were represented. Additionally, the MAACL and the DESIII child measure were based upon test development strategies other than the factor analytic. Again, this provides further evidence (see STAIC discussion presented previously) that the use of factor analyses in the combined inductive-hypothetico-deductive method proposed by Adcock (1954), Cattell (1978), and Royce (1950) may be more appropriate for mood scale development.

With the above review representing the present state of child mood measurement, it is clear that an adequately-conceived instrument is greatly needed. Thus, it is to the development and investigation of just such a measure that we now turn.

Notes for Chapter II

1. The selection of these specific formulations was based on two considerations: 1) Each conceptualization may be considered prototypical of its tradition, and 2) each author has actually extended his ideas into the applied area, by constructing multiple mood instruments based on them.

2. In a personal communication with Dr. Plutchik (June 8, 1979), he stated that, "I believe emotions and moods cannot be clearly distinguished, and that measures of emotion are automatically measures of mood, and vice versa."

3. This measure was first referred to in Plutchik's 1966 paper on multiple affect rating scales; additional emotion/mood instruments have since been developed, and may be found in his most recent book (Plutchik, 1980a).

4. An analogous conceptualization was given by McNair and Lorr (1964, p. 620), who noted that their "concept of mood was similar to the Skinnerian view succinctly stated by Nowlis and Nowlis (1956)".

5. As a side note, Nowlis (1963) acknowledged the great influence which Ryle had excerted upon his own theoretical and empirical work.

6. Even though their review included several mood-rating scales which were to be completed by "others" (e.g. spouse, nurse, etc.), it is apparent that most mood instruments are intended to be of a self-evaluative nature; this, of course, is consistent with the historically-considered view that mood states are indeed subjective.

7. Salzman et al. (1972) pointed out that mood states have been researched under an array of rubrics, including the terms "anxiety", "hostility", "depression", "morale", and "social adjustment"; such a plethora of mood descriptors is believed to be due to the myriad of concepts upon which the various instruments have been based. For as we have seen, there is no presently agreed-upon definition of the terms "mood" or "mood state", and certainly none as to the possible relationship of such words to trait concepts.

8. A perusal of Psychological Abstracts (1950-1983) indicated that this 1981 investigation was the sole research endeavor to have looked at children's self-report mood states in an objective manner.

9. It is of interest to note that Zuckerman's most recent state instrument (Zuckerman, 1977), does rely on factor analytic techniques, even though he had previously chided Cattell for his insistence on the multivariate approach to test development (Zuckerman, 1976). Moreover, Zuckerman (1980) now maintains that his empirically-derived Multiple Affect Adjective Checklist (Zuckerman & Lubin, 1965) was inadequately conceived; the reader may remember from the beginning of this section that the MAACL has been the most oft-cited mood measure (Buros, 1978).

10. A perusal of Buros (1970), Comrey et al. (1973), Chun et al. (1975), and Johnson and Bommarito (1971) indicated that there is a considerable number of personality tests, rating scales, and adjustment measures available for use with children who are in the 8 - 12 year-old age range.

11. Although several recent studies using pre-adolescent children have attempted to either assess their mood, or actually induce a specific mood (e.g., Barnett, King & Howard, 1979; Bartlett, Burleson, & Santrock, 1982; Bourgeois-Bailetti & Cerbus, 1977; Cameron, 1975; Rosenhan, Underwood, & Moore, 1974; Underwood, Froming & Moore, 1977), none has used an

objective method to determine the effectiveness of their procedures. Others, such as Barton and Cattell (1974), or Lira, White, and Finch (1977), have employed adult state measures with adolescent subjects. This latter procedure appears to be a common practice when the subjects used are within their teen years (e.g., McNair, Lorr, & Droppleman, 1971b; Zuckerman & Lubin, 1965).

12. Endler (1975) and his associates (Endler & Magnusson, 1976; Endler, Magnusson, Ekehammar, & Okada, 1976) have provided evidence for the multidimensional (rather than the purported unidimensional) nature of the STAI. They found that this adult version was actually comprised of no less than three factors, and quite often four, depending on the subject sample.

13. Examples of such "select sample" measures include the State-Trait Anxiety Inventory for Children, which was discussed above, and which is reserved for children nine to twelve years old (Spielberger et al., 1973b); the Children's Personality Questionnaire, again for the nine to twelve year old range (Porter, Cattell, & Ford, 1968); and the Culture-Free Self-Esteem Inventory for Children, which includes grades three through high school (Battle, 1976; Battle, 1981).

14. For those interested, the factor loading matrix upon which this interpretation was based, may be found in Kotsch, Gerbing, and Schwartz (1982), pages 272-273.

III. THE PRE-ADOLESCENT MOOD SCALE:
DEVELOPMENTAL PROCEDURES

In devising a multiple mood measure for pre-adolescents, one must take into account not only their level of verbal comprehension, but also their ability to discriminate among various shadings of feeling states. My Master's thesis (Schokman-Gates, 1981) was specifically aimed at determining just what mood words/phrases did have state-meaning for children in the seven-to twelve-year old age range. Such delineation must be considered an essential stage of test development when one is attempting to tap an unexplored area (childhood mood states) which is so private to the individual (introspective experience). Accordingly, a synopsis of this prior investigation will be presented first, to be followed by the further steps undertaken in the development of the actual mood scale.

A. Pre-Adolescent Mood Structure

Using already established adult mood adjectives, a preliminary list of 447 state-descriptive words and phrases was compiled. In order to ensure item-suitability for pre-adolescents, each word (or phrase) was assessed for comprehensibility and frequency within grades three through six. Additionally, the least frequent word of any of the "redundant-synonym" or antonym pairs, such as "angry"-"mad" or "happy"-"unhappy" was removed from the listing. As a counter-check on the utility of the remaining 114 items, two forms of a pilot instrument were constructed and administered during the first phase of this study.

The pilot phase was, essentially, a verbal comprehension and association session given to several classes of third grade pupils. Phase 2 involved reduction of these data to 81 mood adjectives which had produced the greatest number of "meaningful mood associators". Additionally, it included the development of a measure which was derived from these items, and the testing of this instrument on 597 pupils in grades three through six.

Following the methods used in adult mood research, correlation matrices for the obtained data were submitted to principal components analyses, using varimax rotations. After five exploratory analyses were run, a final six-factor solution was obtained for each of the four sample groups of males (N=312) and females (N=282; grades were combined for each gender analysis), and grades 3/4 (N=311) and grades 5/6 (N =

283; sexes were combined for each analysis within the grade divisions).

Factor-matching across samples yielded six meaningful unipolar dimensions, nonetheless, because of sex and age differences on factor loadings, selection of items to define a factor was individually done for each gender and grade division (3/4 vs 5/6). A factor was defined by those words or phrases (markers) which had an absolute loading of .35 or greater, with factor names being determined by a perusal of the aggregate meaning of these items, and on the basis of names given to similar factors in the adult domain. The six factors for both sexes and age groups in order of decreasing percentage of variance were: **Surgency**, **Sadness**, **Aggression**, **Mastery/Self-Esteem**, **Depersonalization /Fatigue**, and **Frustration/Embarrassment**. It was from this base that the **Pre-Adolescent Mood Scale (PAMS)** was constructed.

B. Basic Test Format

Ryle (1950) maintained that the avowal of feeling states required no great measure of discernment, but rather a mere acknowledgement of what was internally felt; the significance of such avowals as primary data was not to be denied for they were considered to be "the first and best index" of mood states (p. 103). Likewise, Nowlis (1963, 1965) asserted that the labeling processes which humans engaged in as they matured, made the availability of such semantic responses the best present marker of affective states and state changes. Accordingly, an instrument that allowed for such ready acknowledgement or refutation, when geared to the age range of interest, was believed to be the format most capable of making just such demarcations. Further, because the measure now under consideration was believed to be potentially useful in school, as well as clinical and research settings, the actual test format needed to be one which was readily adaptable to group situations, and yet quick and easy to administer and score.

A measuring technique which fit the bill on all of the above accounts was that of the mood adjective checklist. As Masterson (1975) noted in her critique of this procedure, "the adjective checklist is unparalleled as a personality technique...since it is easy to administer and score, yet can be complex enough to cover a broad range of behaviors; the adjective check-lists typically present subjects with a meaningful and nonthreatening task which meets with a minimum of subject resistance; they can be analyzed a variety of ways, both rationally and empirically; and they are ...a valid source of information in personality assessment" (pp. 304-305). Moreover, use of the MACL within the adult population was fairly extensive--in fact, it was the measure of choice in the majority of mood studies (Nowlis, 1965 & 1970)--with many researchers considering it to be "the best of all self-report measures...in many respects equal to objective behavioral measures" (Radloff & Helmreich, 1968 p. 48). Nonetheless, due to the problems inherent to research with immature subjects (please refer to Chapter I), none of the currently-employed MACLs could be considered suitable for investigating the domain of childhood mood states. Moreover, all of these MACLs relied on adult adjective descriptors, since they had been developed by investigators interested in that domain. Accordingly, item selection for the **Pre-Adolescent Mood Scale** had to be based upon the only information which was available regarding child mood descriptors --my M.Sc. thesis (Schokman-Gates, 1981).

C. Item Selection

Out of the six original factors found in pre-adolescents (Schokman-Gates, 1981), a perusal of these mood dimensions indicated that the first four were the most robust across the different groups and genders:[1] The dimensions of Surgency, Sadness, Aggression, and Mastery/Self-Esteem met the criterion for "factor robustness" by having at least five marker items in-common for all groups on the respective factor; the Frustration/Embarrassment and Depersonalization/ Fatigue dimensions did not attain such levels of commonality. Accordingly, using these four already-determined mood factors, a reduction of each dimension to its five most salient items--based on marker loadings and intrafactor correlations--was accomplished.[2] As Cattell (1978) noted, when a "common-type pattern" is aimed for, it is perfectly legitimate to "obtain the dimensions of a generic or even a composite population, ignoring species variations" (p. 512), since researchers have initially been interested in general patterns, with further specification being carried out using generically-based measures. Likewise, my initial interest was in finding the general, in-common mood dimensions of pre-adolescents, and then in using these as a base for developing the mood-specification measure Once that was done, "species variations" based on age and sex, as well as on environmental conditions, could be determined.

Tables 3.1-3.4, at the end of this chapter,[3] provide information on the marker variables for each population sample on the four state dimensions of Surgency, Sadness, Aggression, and Mastery/Self-Esteem. The underlined markers in these tables represent the 20 state descriptors which were chosen for the final version of the Pre-Adolescent Mood Scale (PAMS).* As can be seen from these data, the majority of item-factor correlations (loadings) on the PAMS variables fell into the .55-.65 range, with some coefficients attaining levels of .73 (joyful and glad of the Surgency scale), and even .76 (strong of Mastery/Self-Esteem). The lowest item-factor correlation was .35 for handsome/pretty (Mastery/Self-Esteem) in grades 5 & 6, nonetheless, its coefficients were considerably higher in the other sample groups (.47, .42, and .48), and thus considered to be an appropriate item to be included in this scale. Moreover, because self-esteem appears to be so intertwined with a perceived self-image,[4] it was felt that a measure of perceived attractiveness would further enhance the breadth of the Mastery/ Self-Esteem subscale--this consideration, however, was secondary to the more pressing requirement of insuring that the final mood descriptors chosen were indeed in-common marker variables, which had scant cross-loadings and high intrafactor correlations.[5] This three-fold requirement was very successfully met with the selection of the 20 PAMS items presented in Table 3.5 (complete factor matrices and Pearson correlation tables may be found in my M.Sc. thesis).

D. The Pre-Adolescent Mood Scale: Final Format

Taking into account the basic test format chosen--that of a mood adjective checklist--and the 20 mood descriptors selected, a brief alphabetical state measure was constructed. Due to the possibility of "reactive effects", the actual instrument was designed to be as non-threatening and non-intrusive as possible, being presented as an "activity", rather than a "test", and using a fairly engaging answer format. This format was comprised of the 20 mood markers (five per factor), each arranged in the center of a box which was headed by the phrase, "Right Now I Feel."[6] Placed in each corner of the 20 item-boxes, and surrounding the mood descriptor of interest, was one of four varying-sized circles. These circles actually represented the response format for the measure, since the child was instructed to draw a line from each item descriptor to the size of circle which best described how s/he felt at the moment. Following the answer-format suggestions made by Kjellberg and Bohlin (1974), the circles graduated in size from the smallest, equalling a response of "not at all" (score of zero), through two intermediate forms ("a little" and "somewhat") and then onto the largest size, which represented the response of "a lot" (score of three). The possibility of "position-effect" was taken into account, and therefore the circles were randomized as far as size and placement were concerned. A brief pilot testing with this specific format, and a discussion session afterwards, indicated its utility for use with seven- to thirteen-year old children (grades 3 - 6). A reduced version of this doubled-sided measure follows on the next page.

Once an appropriate test format is adapted for the construct under consideration, the requisite step to follow is that of providing support for its validity. Accordingly, the next chapter will deal with the rationale behind the specific research designs used for

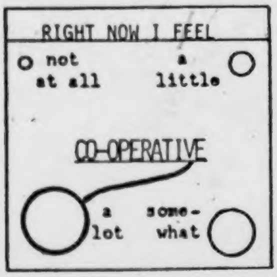
Name: Grade: Age: Boy or Girl (CIRCLE ONE)

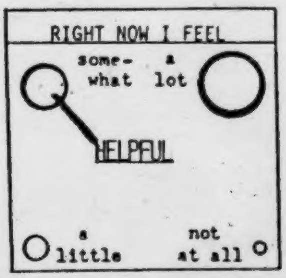
RIGHT NOW I FEEL

(PAMS)

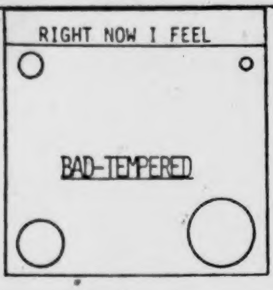
INSTRUCTIONS: Here are some statements which are often used to describe feelings. Please read each statement carefully, and show how you feel by drawing a line from the centre word to the size of circle which best describes how you feel right now.

EXAMPLES:

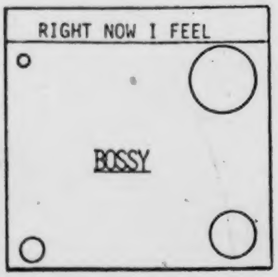

RIGHT NOW I FEEL
not at all
a little
CO-OPERATIVE
a lot
some- what


RIGHT NOW I FEEL
some- what
a lot
HELPFUL
a little
not at all

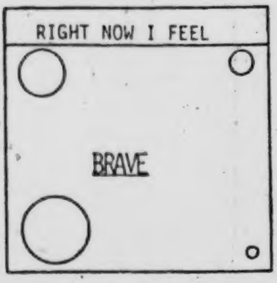
1.


RIGHT NOW I FEEL
BAD-TEMPERED

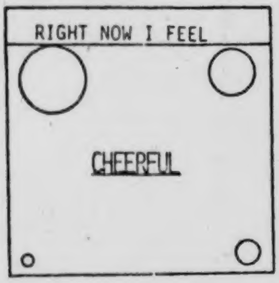
2.


RIGHT NOW I FEEL
BOSSY

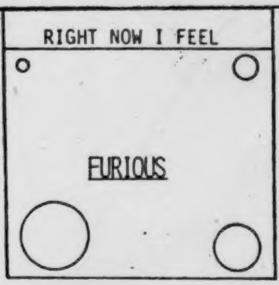
3.


RIGHT NOW I FEEL
BRAVE

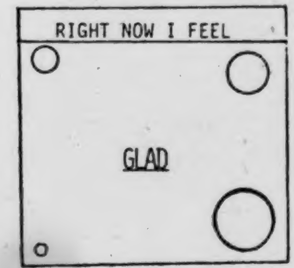
4.


RIGHT NOW I FEEL
CHEERFUL

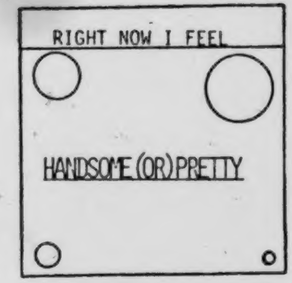
5.


RIGHT NOW I FEEL
FURIOUS

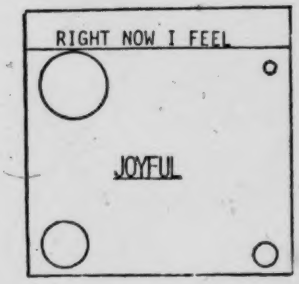
6.


RIGHT NOW I FEEL
GLAD

7.

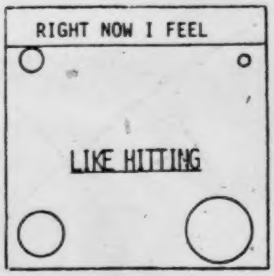

RIGHT NOW I FEEL
HANDSOME (OR) PRETTY

8.

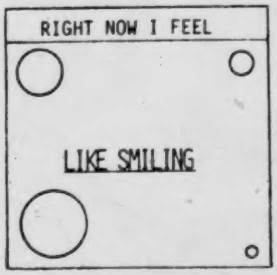

RIGHT NOW I FEEL
JOYFUL

please turn over....

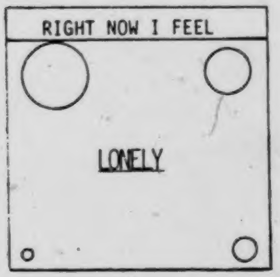
9.


RIGHT NOW I FEEL
LIKE HITTING

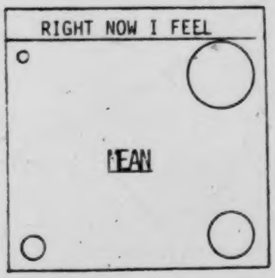
10.


RIGHT NOW I FEEL
LIKE SMILING

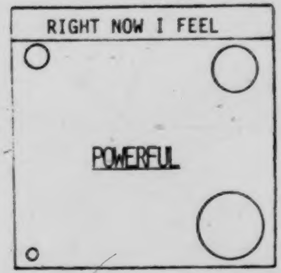
11.


RIGHT NOW I FEEL
LONELY

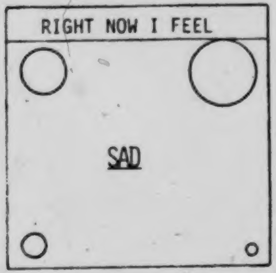
12.


RIGHT NOW I FEEL
MEAN

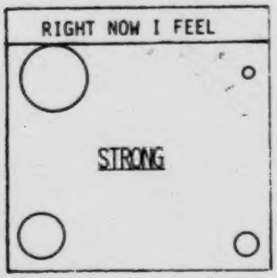
13.


RIGHT NOW I FEEL
POWERFUL

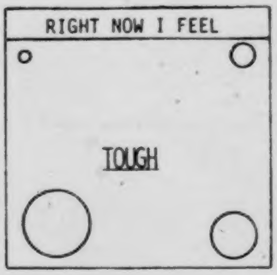
14.


RIGHT NOW I FEEL
SAD

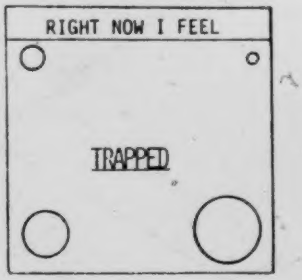
15.


RIGHT NOW I FEEL
STRONG

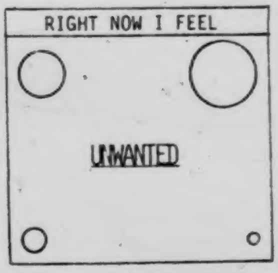
16.


RIGHT NOW I FEEL
TOUGH

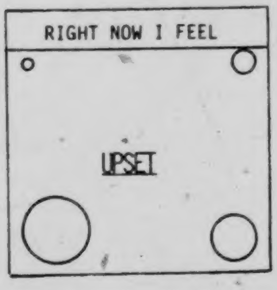
17.


RIGHT NOW I FEEL
TRAPPED

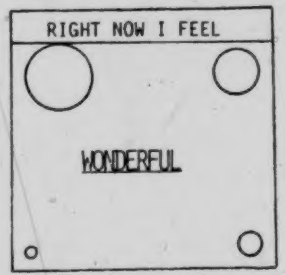
18.


RIGHT NOW I FEEL
UNWANTED

19.


RIGHT NOW I FEEL
UPSET

20.


RIGHT NOW I FEEL
WONDERFUL

the construct and criterion-related validation of the Pre-Adolescent Mood Scale.

Notes for Chapter III

1. Although my previous research (Schokman-Gates, 1981) indicated the presence of at least six in-common childhood mood factors, due to the problem of "unique marker-variables", only four dimensions maintained congruent loading patterns across the different sample distributions; these dimensions were also the four most salient factors of the various samples, and thus, considered to be the most important.

2. Nunnally (1967) warned that in order to use a highly-loaded variable in the process of factor definition, it must first have substantial correlations with its intra-factor cohorts, while also presenting much lower correlations with the inter-factor markers. The factor-analytically derived PAMS was constructed with just such a caveat in mind.

3. Due to the large volume of tables and figures necessary for a proper presentation of the validation results, special sections have been reserved at the end of each chapter for these materials.

4. Wender and Klein (1981) note that individuals with "transient" low self-esteem "are self-critical, demean their accomplishments, [and] believe they are

unattractive" (p. 203). Likewise, research into the general affective states of elation and depression, has revealed that the individual's perceived self-concept (as oppossed to idealized) is greatly altered by the momentary mood: Negative mood states are found to be marked by an increase in unfavorable attitudes toward the self, while positive mood states have the opposite association (Wessman, 1979; Wessman & Ricks, 1966).

5. Even though the item "good" was a fairly strong marker of Factor I (Surgency), it was decided that due to its colloquially ungrammatic usage ("Right now I feel good"), it should be totally eliminated from the finalized version of PAMS.

6. An emphasis was placed upon the immediate feeling ("Right Now"), since prior research has shown that the time interval covered by the instructions has a great influence on determining whether the measure is tapping states or traits (e.g., Martin, 1959; McNair & Lorr, 1964; Zuckerman, Persky, & Link, 1967). Moreover, "by making the checking of each word a commitment of the moment and not of a lifetime, we make the test a prompt or probe....Thus the verbal responses and feelings which vary together with other responses in a mood are

endorsed with greater probability in that mood than at other times. The subject is not describing his mood...he is publically noticing his mood and feelings" (Nowlis, 1963, p. 78).

TABLES FOR CHAPTER III

Table 3.1

MOOD FACTOR: SURGENCY[a]

Females	Factor 1		Males	Factor 1		Grades 3 & 4	Factor 1		Grades 5 & 6	Factor 1	
	Eigenvalue = 14.14			Eigenvalue = 12.82			Eigenvalue = 13.28			Eigenvalue = 13.72	
	% of Variance = 17.5			% of Variance = 15.8			% of Variance = 16.4			% of Variance = 16.9	
PAMS #	Name	Loading	PAMS #	Name	Loading	PAMS #	Name	Loading	PAMS #	Name	Loading
	good	.61		good	.59		good	.67		good	.44
4	cheerful	.62	4	cheerful	.57	4	cheerful	.59	4	cheerful	.54
	excited	.40		excited	.38		excited	.37		excited	.45
	fine	.60		fine	.51		fed-up	-.40		fine	.43
	friendly	.47		friendly	.52		fine	.50		friendly	.37
6	glad	.56	6	glad	.69		friendly	.56		giggly	.38
	great	.64		great	.67		like giving-up	-.40	6	glad	.59
	grouchy	-.46		grumpy	-.47	6	glad	.73		great	.60
	grumpy	-.38		happy	.73		great	.69		happy	.62
	happy	.65		helpful	.49		grouchy	-.37		helpful	.59
	helpful	.43	8	joyful	.73		grumpy	-.43	8	joyful	.72
8	joyful	.69		kind	.62		happy	.76		kind	.57
	like kicking	-.35		liked	.38		helpful	.47		like laughing	.51
	kind	.68		lucky	.51	8	joyful	.69		lucky	.53
	lazy	-.39		miserable	-.42		kind	.71		okay	.38
	miserable	-.46		okay	.42		liked	.36		playful	.49
	okay	.40		playful	.36		lucky	.36		polite	.47
	playful	.40		polite	.38		miserable	-.46		proud	.59
	proud	.42		proud	.45		okay	.41	10	like smiling	.65
	rotten	-.40	10	like smiling	.61		playful	.37	20	wonderful	.60
10	like smiling	.54		bad-tempered	-.37		proud	.39			
20	wonderful	.65	20	wonderful	.57	10	like smiling	.50			
							bad-tempered	-.39			
						20	wonderful	.62			

[a] Data presented in this table are based on the four population samples used in my Masters' thesis (Schokman-Gates, 1981), and represent marker items obtained from principal components analyses, varimax (orthogonal) rotations.

Table 3.2

MOOD FACTOR: SADNESS[a]

Females	Factor 2		Males	Factor 3		Grades 3 & 4	Factor 2		Grades 5 & 6	Factor 2	
Eigenvalue = 5.88			Eigenvalue = 3.94			Eigenvalue = 5.43			Eigenvalue = 5.66		
% of Variance = 7.3			% of Variance = 4.9			% of Variance = 6.7			% of Variance = 7.0		
PAMS #	Name	Loading	PAMS #	Name	Loading	PAMS #	Name	Loading	PAMS #	Name	Loading
	disappointed	.44		afraid	.42	11	lonely	.54		blue	.39
	like giving-up	.38		blue	.41		miserable	.35		disappointed	.47
	grouchy	.36		like crying	.36		mixed-up	.54		disturbed	.42
	ignored	.37		disappointed	.36		nervous	.40		like giving-up	.52
11	lonely	.50		jealous	.36		rotten	.40		ignored	.47
	miserable	.37	11	lonely	.46	14	sad	.65	11	lonely	.54
	mixed-up	.45		mixed-up	.42		shy	.52		miserable	.41
	nervous	.38	14	sad	.62		strange	.48		mixed-up	.53
	rotten	.48		shy	.45		terrible	.45		rotten	.49
14	sad	.56		strange	.35		tired	.41	14	sad	.62
	terrible	.53		terrible	.40	17	trapped	.53		terrible	.52
17	trapped	.55	17	trapped	.52		unkind	.42	17	trapped	.53
18	unwanted	.71	18	unwanted	.59	18	unwanted	.61	18	unwanted	.71
19	upset	.66	19	upset	.67	19	upset	.59	19	upset	.72
	worried	.48		weird	.37		weird	.42		worried	.50
	worthless	.41		worried	.56		worried	.61		worthless	.62
				worthless	.36						

[a] Data presented in this table are based on the four populations used in my Masters' thesis (Schokman-Cates, 1981), and represent marker items obtained from principal components analyses, varimax (orthogonal) rotations.

Table 3.3

MOOD FACTOR: AGGRESSION[a]

Females Factor 3			Males Factor 2			Grades 3 & 4 Factor 3			Grades 5 & 6 Factor 3		
Eigenvalue = 2.89			Eigenvalue = 5.28			Eigenvalue = 3.06			Eigenvalue = 4.27		
% of Variance = 3.6			% of Variance = 6.5			% of Variance = 3.8			% of Variance = 5.3		
PAMS #	Name	Loading	PAMS #	Name	Loading	PAMS #	Name	Loading	PAMS #	Name	Loading
2	bossy	.43		angry	.39		angry	.49		good	-.42
	like crying	.44	2	bossy	.55	2	bossy	.56		angry	.42
	fed-up	.49		cruel	.58		disturbed	.38		awful	.51
	friendly	-.40		like fighting	.51	5	furious	.52	2	bossy	.54
	like giving-up	.35		friendly	-.40	9	like hitting	.50		calm	-.45
5	furious	.45	5	furious	.56		like kicking	.35		cooperative	-.45
	grumpy	.43		grouchy	.43	12	mean	.62		like crying	.42
9	like hitting	.58		grumpy	.35		polite	-.39		cruel	.42
	like kicking	.39	9	like hitting	.50		rude	.60		fed-up	.59
12	mean	.55	12	mean	.59	1	bad-tempered	.37		like fighting	.42
	rude	.41		okay	-.37		unfriendly	.51		fine	-.45
	sassy	.37		polite	-.38		unkind	.56		friendly	-.52
1	bad-tempered	.49		rotten	.37				5	furious	.57
	unfriendly	.57		rude	.58					grouchy	.50
	unkind	.58	1	bad-tempered	.41					grumpy	.38
				unfriendly	.43				9	like hitting	.39
				unkind	.58				12	mean	.42
									1	bad-tempered	.37
										unkind	.41

[a] Data presented in this table are based on the four population samples used in my Masters' thesis (Schoeman-Cates, 1981), and represent marker items obtained from principal components analyses, varimax (orthogonal) rotations.

Table 3.4

MOOD FACTOR: MASTERY/SELF-ESTEEM[a]

Females	Factor 4		Males	Factor 4		Grades 3 & 4	Factor 4		Grades 5 & 6	Factor 5	
Eigenvalue = 2.31			Eigenvalue = 2.27			Eigenvalue = 2.35			Eigenvalue = 2.14		
% of Variance = 2.9			% of Variance = 2.8			% of Variance = 2.9			% of Variance = 2.6		
PAMS #	Name	Loading	PAMS #	Name	Loading	PAMS #	Name	Loading	PAMS #	Name	Loading
3	brave	.38		active	.44	3	brave	.50		ashamed	-.37
	excited	.36	3	brave	.56		giggly	.38	3	brave	.45
	like fighting	.44	7	handsome/pretty	.42	7	handsome/pretty	.48		like fighting	.41
	giggly	.50		playful	.44		like laughing	.45	7	handsome/pretty	.35
7	handsome/pretty	.47	13	powerful	.68		lucky	.44		like hitting	.42
	jumpy	.54		proud	.40		playful	.47	13	powerful	.67
	like laughing	.57	15	strong	.72	13	powerful	.68		proud	.35
	lucky	.37	16	tough	.63		proud	.41	15	strong	.76
	playful	.46				15	strong	.72	16	tough	.71
13	powerful	.60				16	tough	.57		weak	-.35
	proud	.42									
15	strong	.71									
16	tough	.59									

[a] Data presented in this table are based on the four population samples used in my Masters' thesis (Schokman-Gates, 1981), and represent marker items from principal components analyses, varimax (orthogonal) rotations.

Table 3.5

Pre-Adolescent Mood Scale Items

Item #	Scale: **SURGENCY**	**SADNESS**	**AGGRESSION**	**MASTERY/SELF-ESTEEM**
1.			Agg1 BAD-TEMPERED	
2.			Agg2 BOSSY	
3.				Sem1 BRAVE
4.	Sur1 CHEERFUL			
5.			Agg3 FURIOUS	
6.	Sur2 GLAD			
7.				Sem2 HANDSOME (or) PRETTY
8.	Sur3 JOYFUL			
9.			Agg4 LIKE HITTING	
10.	Sur4 LIKE SMILING			
11.		Sad1 LONELY		
12.			Agg5 MEAN	
13.				Sem3 POWERFUL
14.		Sad2 SAD		
15.				Sem4 STRONG
16.				Sem5 TOUGH
17.		Sad3 TRAPPED		
18.		Sad4 UNWANTED		
19.		Sad5 UPSET		
20.	Sur5 WONDERFUL			

IV. THE PRE-ADOLESCENT MOOD SCALE: RATIONALE FOR TEST VALIDATION

Fiske (1971) maintained that in order "to advance the science of personology, intensive effort must be devoted to each major construct, to delineating it explicitly and systematically, and to creating measuring procedures conforming to the blueprints derived from such a conceptualization. Once we have created, tested, and refined these measuring procedures, we can begin to carry out empirical studies of the theoretical propositions involving that construct" (p. 14). As a first step in this direction, my Master's thesis (Schokman-Gates, 1981) was concerned with the "explicit and systematic delineation" of mood structure in pre-adolescents, while the present research constituted the second step--one of instrument creation, testing, and refinement in order to allow for the empirical study of the mood constructs purported.

The form that the instrument finally assumes--its quality and "goodness of fit" for the specific purposes --depends on both carefully selected content, and the adequacy of methods used in its development. Thus, as Jackson and Messick noted, "a necessary precondition for a sound program of test development or assessment is an awareness of methodological alternatives" (1967, p. 161). Moreover, as was asserted by Loevinger in her monograph on test development (1957), "logically, the kind of validity a test achieves is independent of the method of test construction. If one asks, however, how best to construct a test, the answer is that each kind of validity contains by implication a program of test construction....Only construct validity, which aims at measuring real traits [or states], promises tests which will both draw from and contribute to psychology" (p.689). Further, she maintained that only the combined evidence of proper item-selection, stable internal-structure, and predictability of external-relations (criterion-related validation)[1] can establish such validity in a newly-developed measure. In accord with this view, then, a discussion of the PAMS validation procedures, and the methodologies used, will follow.

After rigorous investigation had confirmed the presence of a basic pre-adolescent mood structure (Schokman-Gates, 1981), it was thought appropriate to provide some technique for measuring that construct. Based on prior research into both the adult and child assessment areas, it was decided that the final version of the **Pre-Adolescent Mood Scale** would consist of five items for each of the four factor-derived scales.

The next phase in its development, then, entailed the process of validation and reliability. In order to validate this factor analytically-derived measure, however, it became necessary to not only determine its **construct** validity, but also that of **factor** invariance: For as Anastasi maintained, "the validity of a psychological test should not be confused with an analysis of the factors which determine the behavior in consideration" (cited in Cronbach & Meehl, 1967, p.62). Thus, attention was paid ~~to~~ both experimental manipulation, and techniques necessary to demonstrate factor validation and consistency. Such a two-fold validity process is an important consideration if, indeed, the PAMS is intended to be used for providing evidence of state change in children. Moreover, as noted by Cronbach and Meehl, "construct validity **must** be investigated whenever no criterion or universe of content is accepted as entirely adequate to define the quality to be measured" (1955, p. 282). And, as we have seen in the literature review, the area of adult mood study is replete with various definitions and theories--none of which has been found to be "entirely adequate"--with those pertaining to children being in an even sorrier state.

In such instances, Guilford (1948) encourages the use of factor analysis for construct validation: "A factorial description is exact and stable; it is economical in explanation; it leads to the creation of pure tests which can be combined to predict complex behaviors." Furthermore, Eysenck's (1950) "criterion analysis" provides evidence that factoring is also efficacious in testing explicit hypotheses regarding the construct (construct and criterion-related validation). For example, if our conceptualization leads us to believe that two groups will differ on the PAMS, this expectation may be assessed by factor analysis (evidence of same dimensions, but alteration of factor salience), as well as by analysis of variance.

Cattell (1965) and Royce (1950 & 1967) both broached this issue when they presented arguments regarding the correct usage of factor analysis and anova. In fact, Royce maintained that any "properly-conducted" research program must include both factor analysis and analysis of variance techniques.

Likewise, Cattell (1978) views factor analysis and anova as being "indispensable common work-horses", with a time and place for each to be strategically applied. Accordingly, rather than follow the commonly-suppossed hypothetico-deductive research sequence (which must rely on inductive observations anyway), Cattell, like Royce and Thurstone (1967) before him, advocates the more realistic inductive-hypothetico-deductive method: "Most areas would be best first attacked by a concept-generating and hypothesis-sharpening factor analysis, followed by bivariate designs in which the factors become the variables" (1978, p. 13).

In reference to this latter method, Adcock (1954) notes that due to the multiplicity of variables upon which subjects may differ, it is usually extremely difficult "to disentangle the complicated causal net" unless one has first based the observations on a large number of cases; and it is here that factor analysis comes to the fore: Such a statistical procedure is able to handle not only a myriad of variables and subjects, but it is also able to bring out basic factors, and provide greater understanding of why a test would work in certain areas, but not in others. Thus, "factor analysis is probably the most elegant method presently available for finding out what a variable 'really' measures" (Baggaley, 1964, p. 167). Moreover, factor analysis can indicate which independent or dependent variables should be of prime concern for statistical testing via the analysis of variance. In order to use this method to the best advantage for my purposes, however, factor invariance (similarity) across conditions on the PAMS subscales had to first be assured.

Such invariance is considered to be both a necessary and important condition (Henrysson, 1957) for attributing explanatory significance to the factors--however, it is not sufficient unto itself. And herein lies the utility of such statistical methods as analysis of variance and multiple comparisons, for if the factors upon which the PAMS is based are indeed "real" and stable, then non-factorial research will bear this out.

Nevertheless, so varied are the research alternatives available for construct validation, that Cronbach and Meehl (1955) maintained that the "investigation of a test's construct validity is not essentially different from the general scientific procedures for developing and confirming theories" (p. 300)--and thus, such validation appears to be especially important if progress is to be made in the study of childhood mood states. Moreover, when the concept under consideration happens to be one which has no external criterion measure, "it is simply not possible to design any single experiment to evaluate the amount of construct validity....One can develop confidence in the value of any construct and in the construct validity of a set of measures only as a result of a series of experiments in which it is found that...[differences are] in accord with theoretical predictions" (Kelly, 1967, p.48).

In line with the above counsel, then, the validation of the Pre-Adolescent Mood Scale involved the use of both factor analytic and analysis of variance techniques. Due note was also taken of the need for more than a "single experiment", and therefore the research program involved 12 separate conditions evaluated within two repeated-measures designs. Moreover, because any properly-conducted validation study must additionally include a wide range of subjects, two different population bases (urban vs rural) were used, with the total sample size for this investigation being 947 pre-adolescents.

A. Quasi-Experimental Conditions and Hypotheses

Mehrabian (1979) asserted that the introduction of a novel environment to a child subject might totally alter the emotional response elicited to the variables under consideration: "Laboratories differ considerably in their emotion-producing effects....There is evidence to indicate that children behave differently when presented with the same task in different places... [since] complex, novel, unpredictable and dense environments are more arousing than simple, familiar, predictable and sparse ones" (pp.274-275 & 277). Thus, the "true" mood reactions which a child would give to a specific situation, might often be masked by the confounding influences of a laboratory setting.

Taking due note of this evidence, and in order to obviate such a possibility in the validation of the **Pre-Adolescent Mood Scale**, two quasi-experimental studies were undertaken in the Edmonton and Wetaskiwin Public School Systems. In the first study, emphasis was placed upon mood effects induced by classroom activities, while the second study was concerned with state differences produced by the physical and structural aspects of the school and classroom.

Edmonton Sample:
Exam vs Film (Control) Condition

A Latin Square design with 33 third through sixth-grade classes in Edmonton, Alberta, was used in an attempt to validate the measure against the manipulative settings of mood state just prior to an exam vs just prior to an in-class movie. The selection of these two settings was based upon prior classroom research, as well as discussions with the actual principals and teachers involved in this project: Sarason et al. (1960) and Spielberger et al. (1973b) have found high increases in the anxiety level of children immediately before exams, and, although anxiety is but one state involved in a student's overall mood, one may logically infer from this research that an exam would also produce other mood changes. Moreover, investigations in the adult domain (e.g., Bartlett & Izard, 1972; Bohlin & Kjellberg, 1975; Nowlis & Green, 1965; Plutchik, 1966; Spielberger et al., 1976; Thayer, 1967 & 1978; Zuckerman, 1976) have shown that the one in-class activity which has the most pervasive and negative affect on student mood states is that of an examination, while the "normal lecture" day has always served as a control condition.[2] Nevertheless, because classroom activities are so different between college and elememtary school, a control condition other than the "normal lecture" had to be found for the pre-adolescents in this study.

After discussing the above control-condition "problem" with the schools participating in the research, the in-class movie or film was discovered to have been the most frequently-mentioned "neutral activity". The children were neither held responsible for the material presented, nor did they even have to attend to the movie if they were so disinclined, thus a film inspired none of the apprehension that an exam usually did. Moreover, the film treatment may have been even more of a "control condition" than that used in the adult studies, since a "normal lecture day" implied that the students would have to pay at least some attention to what the instructor would be saying (i.e., they would be held responsible for the material, and hence, there was the need for them to concentrate on the classroom presentation).

The Latin Square design used in this study also allowed for the mood effects of diurnal variation to be discerned, since prior research both in the adult (e.g., Howarth, 1979; Taub & Berger, 1974) and child domains (adolescents: Barton & Cattell, 1974; pre-adolescents: Schokman-Gates, 1981) has indicated that time-of-day variables may be of considerable importance. Randomization of these time periods within the school day, therefore, was also carried out. Tables presenting the specific experimental designs for both the construct and criterion-related validity studies may be found in Chapters V and VI (Tables 5.1 & 6.1, respectively).

Due to the quasi-experimental nature of this study, any specific experimental hypotheses would be untenable since influences other than the exam or film would be operating in each of the 33 classrooms. Nevertheless, the following hypothesis in regard to construct validity may be advanced:

Construct Validation Hypothesis 1. The construct validity of the Pre-Adolescent Mood Scale will be supported by data gathered in the Edmonton sample, and by evidence provided by:

a) congruent exploratory factor analyses in both the exam and film conditions;

b) congruent confirmatory factor analyses in both the exam and film conditions;

c) dR-factor analysis confirming the presence of four independent mood scales;

d) congruent indices of factor invariance between the exam and film conditions; and

e) congruent indices of state dimensionality, internal consistency, and reliability for both the exam and film conditions.

Moreover, based on the findings of the adult mood literature in relation to exam mood-effects, and of my Master's research in relation to gender, age, and diurnal variation-effects, the following hypothesis in regard to criterion-related validity is advanced:

Criterion-Related Validation Hypothesis 1. The criterion-related validity of the **Pre-Adolescent Mood Scale** will be supported by data gathered in the Edmonton sample, and by evidence provided by:

a) differential mood-effects found for the exam and film conditions;

b) differential mood-effects found for the gender variables;

c) differential mood-effects found for the age (grade) variables; and

d) differential mood-effects found for the time-of-day variables.

Being more specific in regard to the four purported empirical lines of evidence to be obtained, it is expected that differential mood-effects will be shown in higher negative and lower positive mood states just prior to an exam. Nonetheless, because the film condition is believed to be essentially a control, it is not expected that its mood-effects will be exactly oppositional to those of the exam, but rather, following more along the lines of evidence provided in my Master's thesis (Schokman-Gates, 1981): The positive mood state of **Surgency** will be dominant[3] in both males and females at all grade levels, with the remaining three states being more dependent upon gender and age differences in their relative ordering of salience. Thus, **Sadness** will appear as the most important negative state for the girls, while **Aggression** will be the predominant negative mood noted in the boys. The positive mood state of **Mastery/Self-Esteem** will maintain its same position for both genders and all age groups, nevertheless, it is expected that males will attain higher scores on this scale than will the females.[4]

Because the diurnal mood-effects noted in my Master's research were based upon an **expanded** set of factor markers (as will be remembered, the PAMS is comprised of the **most robust** items from these sets), direct specification of expected results would be inappropriate. Nevertheless, it is appropriate to propose from those data that the present investigation will find a downward trend in **Surgency** noted for both sexes over the course of a day, with increases in **Sadness** and **Aggression** also being evident. Time-of-day variables are not expected to be important for the **Mastery/Self-Esteem** mood scale in the Edmonton study.

Since the above research plan was concerned with the affective states of pre-adolescents who were in a "down" or "negative" condition, it seemed prudent to also evaluate what affect an "up" or "positive" condition might have on the children's moods as measured by the PAMS. Nonetheless, because of the great divergence in classroom activities that occur among the different grades and even between different classrooms, there appeared to be no single activity which could serve as a comparable "up" condition for all of the students. There was, however, an on-going research project being conducted by Alberta Education (Wohlfarth, 1981) which appeared to be partially suited to the objectives of this study. It involved a rather substantial grant to the Wetaskiwin School District for the purpose of altering the physical characteristics of three elementary schools; a fourth school had been included as a control.

Wetaskiwin Sample:
School Color/Light vs Control Condition

Based on years of research into the effects of color upon psychophysiological processes,[5] Professor Harry Wohlfarth of the University of Alberta, has found that color and light modification of the school environment may have profound effects on the behavior of handicapped children (Wohlfarth & Sam, 1982 & 1983). Other researchers in the field (e.g., Harmon, 1945; Ott, 1965 & 1973; Pellegrini et al., 1981; Schauss, 1981a) have discovered the beneficial affects of either light modification or color modification on the physiological and psychological reactions of both children and adults. None, however, has systematically combined the modifications of both light and color in order to determine the effects on "normal" school children--none, that is, until the Wetaskiwin project, where, of the four schools involved, two have the "beneficial" full-spectrum lighting, two have the newly-prescribed color scheme[6] (one school has both modified light and color), and one has neither. This last school, which serves as a control, has been left in its original condition, with conventional fluorescent lighting and a hodge-podge of classroom colors.

Ideally, measurements using the **Pre-Adolescent Mood Scale** would have been taken at the commencement of this project, and then periodically and at different school hours throughout the year, however, because the Wetaskiwin study was well under way in the Fall of 1982, a different research tack became necessary: A single-day repeated measures design with 19 third- through sixth-grade classes in Wetaskiwin, Alberta, was used in an attempt to validate the measure against the four environmental-school conditions discussed above. Such a design would allow for any cumulative environmental mood-effects to be discerned--for example, would there be differences between the one control and the three experimental schools' morning and afternoon moods? Moreover, just as with the Edmonton sample, it would also allow for any mood-effects of diurnal variation to be discerned.

In line with the "down" or "negative" condition described for the Edmonton study, this "up" condition was comprised of at least five times as many children as items[7] in order to test for factorial validity across the two sample conditions within the Wetaskiwin project. Moreover, this large number of subjects also allowed for such testing between the Wetaskiwin data and those obtained in the Edmonton samples. If factor invariance across all of these groups was found to be high, then the PAMS would be considered to have construct validity due to a reliable factor structure (e.g., Comrey, 1973). Additionally, by comparing the two diverse population samples in these studies, valuable information regarding the moods of children from both an urban (Edmonton) and rural (Wetaskiwin) setting may be obtained. Tables presenting the specific experimental designs for both the construct and criterion-related validity studies may be found in Chapters V and VI (Tables 5.8 and 6.9, respectively).

As with the Edmonton investigation, the quasi-experimental nature of this study precludes the specification of experimental hypotheses. Nonetheless, the following hypothesis in regard to construct validity may be advanced:

Construct Validation Hypothesis 2. The construct validity of the **Pre-Adolescent Mood Scale** will be supported by data gathered in the Wetaskiwin sample, and by evidence provided by:

a) congruent exploratory factor analyses in both the morning and afternoon conditions;

b) congruent confirmatory factor analyses in both the morning and afternoon conditions;

c) dR factor analysis confirming the presence of four independent **mood** scales;

d) congruent indices of factor invariance between the morning and afternoon conditions, and between those conditions and the exam and film treatments of the Edmonton sample; and

e) congruent indices of **state** dimensionality, internal consistency, and reliability for both the morning and afternoon conditions.

Moreover, based on previous findings in the area of color and light psychodynamics (see note 5 of this chapter and Wohlfarth, 1981), as well as those in relation to gender, age, and diurnal variation mood-effects (Schokman-Gates, 1981), the following hypothesis in regard to criterion-related validity is advanced:

Criterion-Related Validation Hypothesis 2. The criterion-related validity of the **Pre-Adolescent Mood** Scale will be supported by data gathered in the Wetaskiwin sample, and by evidence provided by:

a) differential mood-effects found for the school color/light vs control conditions;

b) differential mood-effects found for the gender variables;

c) differential mood-effects found for the age (grade) variables; and

d) differential mood-effects found for the time-of-day variables.

Being more specific as to the above purported empirical lines of evidence, it is expected that differential mood-effects for schools will be shown by higher positive and lower negative mood states in the experimental schools as compared to the control. Moreover, due to the evidence for the beneficial effects of both light (e.g., Mayron et al.,1974; Ott, 1965 & 1973; Wohlfarth & Sam, 1982 & 1983) and color (e.g., Greene, Bell, & Boyer, 1983; Mehrabian, 1979; Pellegrini & Schauss, 1980; Pellegrini, Schauss, Kim, & Ah You, 1981; Schauss, 1979 & 1981a,b), it is believed that the color- and light-altered school (Norwood) will be the one most beneficially-affected (i.e., **Surgency** and **Mastery/Self-Esteem** will be elevated, while **Sadness** and **Aggression** will be depressed), and that the control school (Centennial) will be the least. The other two experimental schools--Parkdale with light-alteration only, and McMurdo with color-alteration only --are expected to fall in the intermediate range.[8] Lastly, the differential mood-effects for gender, age (grade), and time-of-day variables are expected to be the same as those noted for the Edmonton study. The reader, then, is therefore asked to refer back to the discussion section following Criterion-Related Validation Hypothesis 1.

Perhaps a note of explanation should be included here: I do not claim to be an expert in either the field of color or light psychodynamics--those are not my areas of interest--nor is the aim of this dissertation to confirm or deny any hypothesis put forth within those fields; such would be better left to those who can claim a degree of expertise. Rather, my sole concern is with construct and criterion-related validation, and hence, with whether or not there would be differential effects on the Pre-Adolescent Mood Scale produced by different treatment conditions, be they of a manipulative (e.g., the exam vs film condition), or environmental nature. The ongoing Wetaskiwin project provided but one avenue for such research.

B. Techniques of Analysis

Due to the fact that a number of considerations must be taken into account when attempting to validate a mood instrument, the following section will devote considerable attention to the various techniques chosen for the data analyses. Of special concern, due to the premier position of construct validity in test development, will be those measures chosen for the construct validation studies.

Treatment of Data

The **Pre-Adolescent Mood Scale** sheet for each subject was individually scored using a specially-constructed acetate overlay. This overlay had the response value for each item-selection printed on it, making it very easy to note what answer the child gave; an example of what the mood sheet and scoring overlay would look like is included in Appendix E. Moreover, in order to most efficiently record the answers for each of the almost 1900 mood forms, a **PAMS** Scoring Sheet was designed in such a way that the responses of six subjects could be noted on one sheet. A copy of this form may be found in the Appendix, following the scoring overlay example.

When used in conjunction with the overlay, each child's set of responses (two PAMS sheets) took approximately one and one-half minutes to score. Following the manual recording of these mood responses, they were then key-punched, by subject, onto two standard IBM data cards. The 20 mood items were assigned values of 0 = "not at all", 1 = "a little", 2 = "somewhat", and 3 = "a lot", while males were coded as 1 and females as 2. School grade was also entered into the analysis, with 1, 2, 3, and 4 serving as codes for the third through sixth grades, respectively. Additionally, diurnal variation was considered, with values of 1 through 4 representing the two morning and two afternoon school periods in Edmonton; for the Wetaskiwin data, morning and afternoon test sessions were recorded as 1 and 2, respectively.

The possibility of response set was considered prior to the actual analysis, with a perusal of each PAMS form, as it was scored, revealing no position- or acquiescent-sets. In any type of psychological test it would normally be expected that at least a few subjects would answer according to the dictates of social desireability. Nonetheless, other researchers have indicated that this may not be the case in mood measurement.

Green (1965) found that when a subject was instructed to answer according to how s/he "normally" or "usually" felt, there was a positive correlation with her/his ratings of the same mood adjectives when they had been assessed as to their level of social desireability; no such findings appeared when the subject was instructed to answer according to the usual mood-measure root of "right now I feel"--the same root phrase, incidentally, that the PAMS employs. Nowlis (1965) explained this finding by stating that "the social desireability status of a word has very little, if any, effect on how it is checked when a subject is asked to report how he feels at the moment he reads each word" (p. 370), since the subject is aware that he is only making a commitment of the moment, and not of a lifetime. Moreover, my Master's research (Schokman-Gates, 1981) suggested that social desireability did not appear to be a problem in the pre-adolescent sample: "the children tested had either not yet become cognizant of social-desireability responses, or if they had, they did not feel threatened enough in the test situation to use them" (p. 94).

Further evidence that this may very well be the case with pre-adolescents comes from Harter's (1981) research into children's intrinsic vs extrinsic orientation in the classroom. Her data indicated that there was a developmental trend in need-for-teacher approval, with the younger children (grades 3-6) having a significantly lower ($p<.001$) need-for-approval score than did the grade 7-9 students. In a similar vein, Cronbach (1975) presented evidence for the total lack of any type of response-set bias in grades 3-8. Moreover, he noted that this test-taking behavior occurred most readily when the items presented were either difficult to answer or ambiguous in their meaning. As Masterson noted in her critique of mood adjective checklists, such tests "typically present subjects with a meaningful and nonthreatening task which meets with a minimum of subject resistance" (1975, p. 305); hence, just such a test format appears to be the answer for reducing any such "test-taking" behaviors in pre-adolescents also. These results, taken as a whole then, suggest that mood measurement in children should not be greatly affected by any form of social desireability or response-set bias; such assumptions appeared to have been affirmed by the data gathered in the present investigation. Nevertheless, in order to conclusively state that the response bias tendency did not significantly enter into these findings, the partialling technique advocated by Lorr (Lorr & Shea, 1979; Lorr & Wunderlich, 1980) was carried out on both the Edmonton and Wetaskiwin data sets. When response bias was controlled for by this procedure, correlations between the scales were found to either decrease or remain the same. In no instance did they reveal any significant elevation, thus providing further evidence for the unipolar nature of the PAMS mood factors.

Construct Validation Analyses

As previously-noted, any research program which may be considered "properly-conducted" must begin with the determination of basic structure via factor analysis[9] (Royce, 1950). Nonetheless, within the first step of such a program, various research designs are possible depending upon the construct under consideration. The one most commonly associated with the mood area is that of R-technique factor analysis. In this design, correlations between scales, and/or items within those scales, are obtained from a large group of subjects on one occasion. These intercorrelations then form the basis for the factors, which represent reduced subgroups of the original items. Such new groupings are capable of distinguishing among subjects as efficiently as did the larger number of initial measures.

In addition to providing the means for more concise instruments, the R-technique design may also allow for the discovery of basic mood structure. Nonetheless, there are problems with this method--for, as Howarth and Schokman-Gates (1981) note, it is also the primary factor analytic means for determining dimemsions in the trait realm. In fact, several investigators (e.g., Cattell, 1973; Howarth & Schokman-Gates, 1981) assert that a considerable amount of research claiming to represent mood factors may in reality only be tapping those of traits: "The authors have actually done R-technique analyses and guessed that factors may be state dimensions....the conceptual-methodological flaw in this work...is that R-technique rather than P- or dR-technique was used as if it were capable of locating pure states" (Cattell, 1973, p.196). For due to their "repeated-measures" nature, both P- and dR-techniques are actually more suitable for determining the transient nature of states than is that of the "single-shot" R-technique.

The problem with a P-technique design, however, is the considerable amount of subject time required, for it consists of many repeated test occasions (Cattell insists on at least 50-100) on the same individual, resulting in covariance between measures over these occasions. Such correlations are then factored to determine the number of independent state dimensions necessary to account for the observed covariation. A further complication with this technique is the fact that state patterns may not be consistent across subjects, and thus more than one or two people would be required to carry out the rather onerous task of numerous repeated-measures.

Differential R-technique (dR), on the other hand, is more readily amenable to experimentation since it is the subject's difference-score between two occasions that is entered into the factor analysis, rather than his/her single-occasion score, with the assumption being made that if the construct actually is one of state, the subject's score will change differentially over time (Cattell, 1965). Moreover, it is believed that if the state factors are "real", the "significance is not that the difference score analysis yields factors that are derivatives of the separate occasion factors but, rather, that it yields the same factors; same in that the difference score factor pattern and the separate occasion factor patterns are invariant" (Nesselroade & Cable, 1974, p.276). These state dimensions, then, are common dimensions since they describe change for all people, but, unlike P-technique, they do not rest on a good sample of days. Thus, each of these designs has its strengths and weaknesses, with perhaps an integration of the three techniques being the best solution for determining state dimensions.

Cattell (1973) deals with this issue by stating that although the total-integrative approach would be the optimal method in mood research, due to its rather onerous and exacting nature, compromise is not at all untenable: "Unitary source states (the dimensions by means of which mood states may be precisely specified) are not located by introspection alone or by selecting items showing high variability and fluctuation (which may indicate mere item unreliability) but by coordinated use of P- or dR-techniques and by comparisons with grid analysis and R-technique" (p.226). Such a comparison is possible since the R-method taps influences of both trait and state variables at any given moment of assessment; the stable trait is measured, as is the momentary level of mood in the individual. In order to determine the mood influences, however, it is necessary to separate the trait variance from that of state; either the P- or dR-technique is ideally suited to this, since each uses the deviations of scores for the individual. Therefore, whatever is stably characteristic of the individual will not enter into the measurement, and thus research using R- plus dR-technique should be capable of delineating what state factors actually exist: That is, either dR- or P-design may be used to confirm factors discovered by the conventional R-technique method.

In the present investigation, the joint use of R- and dR-techniques was employed, with both principal components and principal axis factor analyses being carried out. Nevertheless, these analyses were considered to be of a purely exploratory nature. Further analyses, using confirmatory factor analytic techniques, would be necessary in order to confirm the construct validity of the Pre-Adolescent Mood Scale.

As Joreskog (1978) noted:

> That exploratory factor analysis may be quite useful in the early stages of experimentation or test development is widely recognized....The results of an exploratory analysis may have heuristic and suggestive value...and may generate hypotheses which are capable of more objective testing by other multivariate methods....It is highly desireable that a hypothesis which has been suggested by mainly exploratory procedures should subsequently be confirmed, or disproved, by obtaining new data and subjecting these to more rigorous statistical techniques (pp.443-444).

Two quite different methods employed for such an analysis are Kaiser and Caffrey's (1965) alpha, and Rao's (1955) canonical, factor analyses. Theroetically, alpha factor analysis is based on the premise that concern rests with estimating the number of factors present in a universe of variables, based on the evidence provided by n variables sampled from that universe. The criterion for such factor estimation is that they will have a maximum correlation with their corresponding factors in the universe. In contrast to the alpha method of factor confirmation, canonical (maximum likelihood) factor analysis is more concerned with the actual set of variables, and the number of factors which can most adequately predict them: "To be more precise, this is both maximum prediction from the factors of the scores on the variables and of the correlation coefficients in the R matrix obtained from them" (Cattell, 1978).

Since the PAMS was comprised of items which initially had higher intra-factor correlations (as measured in Schokman-Gates, 1981), it would be this latter type of analysis which would provide or deny the evidence necessary for me to claim construct validation for the measure--i.e., that pre-adolescent mood states were well-represented by the factor items present on the Pre-Adolescent Mood Scale. Nevertheless, it was also of interest to see whether the number of "hypothetical" factors obtained would equal that present on the PAMS, or whether there might be other factors not represented but perhaps tapped by these mood scales. All exploratory and confirmatory factor analyses undertaken in this dissertation employed the use of SPSS and SPSSx programs (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975; SPSS Inc., 1983).

An issue of further concern in relation to factor analysis for test development, is that regarding the use of factor-derived scales which also happen to comprise the totality of the factor structure. Kim and Mueller (1978b) address just such an issue in their discussion of factor-scale validity and reliability, with three conditions being noted as necessary in order to claim that a measure is actually one which employs factor scales: 1) Since a measure which is based on factor-derived scales is essentially an hypothesis that the set of items will measure more than a single phenomenon, it is necessary for the number of rotated factors (eigenvalue >1.00) to be equal to the number of hypothesized factors; 2) it is necessary that the rotated factor markers be the same as those hypothesized by the factor-derived scales, with substantially higher loadings appearing on the hypothesized "relevant" dimension than on the others; and 3) it is necessary that any factor extracted subsequent to the number of hypothesized factors be statistically unimportant and substantively uninterpretable. In other words, a factor-scale measure, if adequately developed, should present a factor solution which has only one scale per factor (based on high intra-factor loadings), and few, if any, cross-factor loadings.[10]

One final measure being employed in a confirmatory capacity, albeit this one is of a purely statistical nature, is the recently-devised index for differentiating trait aspects from those of state (Howarth, 1978). This index takes into account the internal consistency of a purported scale, as well as its measure of test-retest reliability: μ = 1- (index of test-retest reliability/index of intra-scale homogeneity). For state measures, a typical value of .40 in the numerator, and .80 in the denominator would produce a μ value of .5, which would fall within the suggested range of "mood" coefficients (.375 to .750).

Although Howarth did not specify what measure of intra-scale homogeneity should be used, subsequent research has supported the utility of this index using several of the conventional types of internal reliability (Logan & Loo, 1979). For the PAMS validation studies, standardized alpha coefficients were used in order to provide support regarding the state nature of the scales being assessed.

The last factor analytic technique to be commented on in regard to conceptual validation is that of factor congruence. As Cattell (1973) noted, "a single factoring, no matter how large the sample, proves nothing. In every one-shot factoring there are a few degrees of rotational uncertainty...only the massive verdice [sic] of consistency over experiments, populations, age groups, and so forth is good enough for conclusions on personality structure" (p.285). Accordingly, there are several research techniques available which may be of service in verifying or refuting the existence of factor congruence. One of these, the configurational invariance method (factor similarity), was used in the present investigation.

The configurational invariance method (Thurstone, 1947) employs the analysis of responses given by different populations to the same set of variables. If caution is taken in regard to the sample populations,[11] then the size of factor loadings should be affected in proportion to the changes in variance of the different test items over the populations. This implies, of course, that the two factor structures are indeed congruent, for if that is so, then the configurations of these loadings should also be congruent.

Prior to Tucker's (1951) formulation of a "congruence coefficient" based on cosines between vectors, visual estimates of such configurations were common-place. Such visual inspection, however, allows for only a qualitative assessment of the similarity, when what is really needed is an objective, quantitative measure. Tucker's coefficient provides just such an objective measure, since it has properties similar to that of the correlation coefficient, with a lower limit set at zero and a maximum value of unity. Nonetheless, he maintained that it should not be considered a measure of factor correlation, but rather a measure of approximate fit: "Two matrices will be considered congruent if they are generally similar with only small random differences" (Tucker, 1951, p.18), as revealed by their attainment of congruence coefficients in the .80 and above range.

In line with the above considerations, the following steps are the usual order for determining configurational invariance. Using the Procrustes method of "confirmatory" analysis, a forced rotation of one of the two factor matrices is undertaken in order to provide the "best estimate" of the second matrix (Nunnally, 1978). Testing for factor invariance (or stability across population samples) is then carried out on the rotated and target matrices using statistical methods, such as the Tucker coefficient described above, as well as a perusal of the transformation matrix (Skakun, 1971). If high coefficients (>.80) are attained, and little transformation was undergone, then factor structure reliability can be claimed for the measure under investigation. Analyses used for verification of such reliability in the two present studies were programmed and documented by Skakun, Precht, and Maguire (1970) of the Univeristy of Alberta Division of Educational Research Services.

In reference to the characteristics of the actual scale-items, the use of several statistical procedures was necessary in order to provide support for the claim that an adequate level of construct validity had been attained by the Pre-Adolescent Mood Scale. Prominent among these are measures of internal consistency and reliability.

Thorndike (1967) noted that when items in a scale were intended to be more or less homogeneous--such that each item tapped the same psychological domain but a different aspect of it--the use of internal consistency data was strongly advised. Moreover, Zuckerman (1979) maintained that in the construction of state instruments, it was essential that some evidence be provided for the consistency of response from one item in a scale to another, with fairly low inter-item correlations being considered indicative of such internal consistency: "Good internal reliabilities are typically produced by average interitem correlations of 0.2 - 0.3. It is the cumulation of these low orders of communality that produces a reliable instrument" (p.47).

Another important form of scale-item analysis is the use of reliability coefficients, nonetheless, for a state instrument certain considerations must be taken into account when choosing the most appropriate measure. Carmines and Zeller (1979) note that although the use of test-retest and split-halves reliabilities[12] may be quite common-place in scale development, they are nonetheless subject to considerable error due to the methods used in repeating or dividing the items. In lieu of these techniques, then, they propose the use of Cronbach's alpha (Cronbach, 1951) in order to determine reliability estimates for the measures under consideration.

In coefficient-alpha analysis the value attained depends on the mean inter-item correlation and the number of items in the scale: $\alpha = Np/[1+p(N-1)]$, hence, if the average intercorrelation of a five-item scale is .63, then its alpha value would be found by

5(.63)/[1+.63(5-1)], and it would equal .894 (as it does for the Surgency subscale presented in Table A.3). Furthermore, coefficient alpha is believed to be related to both the split-halves and alternate-forms reliability methods, since it is viewed as being a unique estimate of the expected correlation of one test with that of another of equal length (Novick & Lewis, 1967). In fact, alpha is considered to be the lower bound to the reliability of a scale, and hence, it provides a conservative estimate of a measure's reliability. Due to these favorable characteristics, as well as its ease of calculation, Carmines and Zeller (1979) maintain that "coefficient alpha should be computed for any multiple-item scale....it is a very general reliability coefficient, encompassing both the Spearman-Brown prophecy formula as well as the Kuder-Richardson 20....the minimal effort that is required to compute alpha is more than repaid by the substantial information that it conveys" (p.51). Following this counsel, then, the reliabilities for each of the PAMS subscales were assessed using Cronbach's alpha, and will be presented separately for the Edmonton and Wetaskiwin data.

Criterion-Related Validation Analyses

In line with Royce's (1950) research prescription, the criterion-related validation of the **Pre-Adolescent Mood Scale** entailed the use of analysis of variance, as well as multiple comparison techniques. Due to the repeated-measures nature of both the Edmonton and Wetaskiwin studies, many of the anova runs were actually analyses of variance for repeated measures (anovar)--a specialized SPSS program, written by University of Alberta MTS consultants (Precht, 1977), which takes into account the error variance introduced by the correlations of the items between occasions. All other "empirical" analyses undertaken in this phase of the validation were based on SPSS programs which corrected for the occurrence of unequal ns (Nie et al., 1975; Hull & Nie, 1981; Precht, 1977). These analyses consisted of the conventional one-way and n-way anovas, t-tests for mean differences, and the multiple range tests of Duncan, Scheffe', and the least significant difference procedure.

Notes for Chapter IV

1. Anastasi (1968) noted that among the many methods used to establish a test's criterion-related validity, the one used quite commonly in personality research is that of "contrasted groups". In this method, the criterion is that of membership vs non-membership within a particular group. With the large number of age, gender, time, and treatment differences present in the Edmonton and Wetaskiwin samples, the contrasted groups method was considered to be the most appropriate for establishing the criterion-related validity of the **Pre-Adolescent Mood Scale.**

2. For several investigators (e.g., Kjellberg & Bohlin, 1974; Lorr, Daston, & Smith, 1967; Spielberger et al., 1973b), this was one of the research designs used for construct validation of their state instruments.

3. The predominance of a "cheerful", "elated", "friendly"-type of dimension has also been consistently found in the adult literature (e.g., Hendrick & Lilly, 1970; Lorr, Daston, & Smith, 1967; Mercatoris, Wilcoxon-Craighead, Craighead, & Schrader, 1979; Nelson, 1971; Wessman & Ricks, 1966).

4. As Hendrick and Lilly (1970) noted, when the question of importance is whether or not the underlying mood factors are indeed stable, one would expect some shifting of their relative salience when measured under different conditions. One would not, however, want to find new dimensions produced by such conditions.

5. Professor Wohlfarth provided a fairly extensive bibliography of research and theory regarding the field of color psychodynamics in the 1982 article which he co-authored with Sam.

6. The newly-prescribed color scheme included a warm shade of yellow on three of the classroom walls to help maintain student energy, while a warm shade of blue was used on the rear wall to help ease "teacher burnout"; other structures within the school (e.g., columns, ramps, stages, etc.) were also included in this new design. Additionally, the "color psychodynamic" rooms had medium blue chalkboards which were believed to aid in student attention and concentration. Full details, including Glidden CIL (Bapco) color code numbers, are presented in Appendix F.

7. One caveat of the factor analytic method is that subjects should total not less than three times the number of variables being investigated (Cattell, 1973), with "acceptably good studies" using at least five times as many persons as items (Cattell, 1978; Nunnally, 1978). Due to the nature of the present investigation (construct and criterion-related validation), a considerably higher ratio of children to items was possible: The Edmonton study employed a ratio of approximately 28:1, while that for the Wetaskiwin sample was approximately 18:1.

8. Only Norwood (experimental) and Centennial (control) were exact structural replicates; such characteristics were not controlled for at Parkdale or McMurdo, therefore there is the possibility of confounded results in these two schools.

9. Fairly limpid presentations of this approach have been provided by Comrey (1973), Kim and Mueller (1978a,b), and Shontz (1965), with five main steps being delineated: 1) proper selection of the variables; 2) computation of the correlation matrix; 3) extraction of the unrotated factors; 4) rotation of these factors; and 5) adequate interpretation of the rotated factor matrix.

10. This prescription for a "good" factor-scale measure is also the one presented by Nunnally (1967) for a "real" factor: "If correlations among the three variables used to define a factor are substantial and correlations between the variables belonging to the two factors are much smaller, this is direct evidence that the factors are 'real'" (p. 358). And hence, the relationship between construct validity and test development noted previously by Loevinger (please refer to the discussion at the beginning of this chapter).

11. One example of such inappropriate population samplings would be response comparisons between 10 year old boys and 60 year old women, for surely their factor structures would differ.

12. Due to the transient nature of state variables, the use of test-retest correlations to assess reliability would be totally inappropriate for investigating the Pre-Adolescent Mood Scale.

V. CONSTRUCT VALIDATION:
METHODOLOGY AND RESULTS

As previously noted in Chapter IV, a properly-conducted research program is first concerned with finding basic structure, via factor analysis, and then with determining the effects of independent variables on this structure (Cattell, 1965; Royce, 1950): "In factor analysis we end by determining what the 'factors' are...in analysis of variance we begin with the knowledge of what the factors presumably are, and we test their statistical significance" (Burt, 1966, p. 286). In accord with this view, the methodology and result sections of the dissertation will be presented in two separate and distinct chapters: Chapter V will be comprised of factor analytic (construct validity) methods and results, with the criterion-related validity data to follow in Chapter VI. This latter chapter will likewise be concerned with the presentation of both methods and results, but they will pertain in this instance to the use of analysis of variance and multiple comparison techniques. Additionally, due to the fact that two diverse populations were sampled, under twelve different conditions[1], both the construct and criterion-related validation chapters will be further divided into sub-areas pertaining to the Edmonton and Wetaskiwin data.

A. Edmonton-Sample Methodology: Exam vs Film (Control) Condition

Subject Sample

This phase of the investigation involved the participation of 569 pre-adolescents chosen from six schools in the Edmonton Public School District. Grades three through six were represented, as were students within several of the remedial learning groups, and all levels of socioeconomic strata. All children within these classes who were present on either day of the test-retest sessions were included in this study. The 33 classes, divided by grade, sex and treatment order, resulted in the sample distribution presented in Table 5.1.

Procedure

Due to the disruption which often occurs in both the teachers' and children's activities when a new person enters the classroom, it was believed that a more accurate gauge of mood change might be obtained if the teacher administered the scale. Additionally, this procedure allowed the instructor to give the questionnaire at the most opportune time, rather than having to structure the children's day around the arrival of a visitor. Thus, using a Latin-Square design, all teachers involved were asked to pass out the PAMS state measure "_immediately before_ (their) next major exam" (or film). In this way, it was hoped that the inclusion of over 1,000 data sets would allow for randomization as to day-of-week, time-of-day, and weather, since all of these variables have been found to influence one's mood state (please refer to the experimental condition section of Chapter IV). Moreover, any practice-effect which might be present in the Pre-Adolescent Mood Scale would also be taken into account through such a design. The two teacher-instruction forms, based on treatment-order, may be found in Appendix E.

B. Edmonton-Sample Results

Using an analysis of variance repeated-measures program, it was ascertained that there was no order-effect produced by the conditions of "exam first- film second" or "film first-exam second". Accordingly, the exam and film data were individually collapsed for their respective treatments, thus allowing for factor analyses on _ns_ of 504 and 451, respectively.

Factor Structure and Congruence

The 20 Pre-Adolescent Mood Scale items previously described were inter-correlated for each of the conditions by means of the Pearson product-moment correlation coefficient; correlation matrices for the exam and film conditions may be found in Appendix D, Tables D.1 and D.2, respectively. Principal components analysis (PC) and principal axis (PA) factoring, using both Varimax (orthogonal) and oblique rotations were then undertaken on the exam and film matrices. The oblique rotations for both classroom conditions closely resembled those of the orthogonal, thus indicating that the purported factors were indeed independent of each other (Kim & Mueller, 1978a,b). Moreover, all of the PC and PA solutions were virtually identical, therefore only the orthogonal factor structures obtained for the principal components analyses will be reported.

Tables 5.2 and 5.3 present data regarding these factor solutions for the exam and film treatments, respectively. As can be seen from this information, similarity in each factor's contribution to the variance is observed for both treatments, nonetheless, there is an alteration in the relative ordering of the factors, based on these treatments: Whereas the exam condition reveals the Surgency subscale to be the most salient, followed by Aggression, Mastery/Self-Esteem, and Sadness, the film condition finds the middle two factors reversed. The knowledge of an impending test appeared to increase the importance of the Aggression factor, while decreasing that mood associated with Mastery and Self-Esteem. The film condition, on the other hand, which was essentially a control treatment, revealed the Mastery/Self-Esteem factor to be more salient for these children than was that of Aggression.

Marker variables for each factor were almost exclusively confined to their appropriate subscales, although several Mastery/Self-Esteem items were found to also appear on the Surgency factor: For the exam structure, brave and handsome (or) pretty revealed loadings of greater than .35 on the Surgency dimension, while only handsome (or) pretty attained this level in the film data. Nonetheless, these cross-loadings were considerably lower than the correlations[2] these items had with their "appropriate" factor of Mastery/Self-Esteem.

A final statistic of note is that of coefficient Theta which is a special case of Cronbach's alpha used to assess the reliability of scales based on principal components analysis (Carmines & Zeller, 1979). Tables 5.2 and 5.3 present coefficients of .867 and .844, respectively, thus indicating very robust indices of internal consistency for the four factor scales.

Because this research endeavor was directed towards providing both emprical and conceptual validation of the Pre-Adolescent Mood Scale, it was thought prudent to also carry out several forms of confirmatory factor analysis on the data. This was especially important considering that the mood measure was wholly derived from prior factor analytic research. Tables A.1 and A.2 in the Appendix present the results of alpha and maximum likelihood factoring on the exam and film data. As can be seen from these factor solutions, confirmation is provided for the four dimensions, with factor salience and marker patterns following that of the PC exam and film analyses.

Thus, from the foregoing results it appears that within the Edmonton sample, the Pre-Adolescent Mood Scale and its four factor-analytically derived subscales, have adequate conceptual validity. Nonetheless, because we are dealing with state rather that trait factors, a final factor analysis was carried out using the differential R-technique. As previously discussed in Chapter IV, dR-factoring removes the subjects' trait-pattern variance which is present in R-technique analysis. It, however, also adds a certain degree of error based on non-subject occasion differences between the first and second administration. Thus, Cattell (1979) advocates the combined use of R- and dR-techniques when investigating the state domain. The results for the differential R-factor analysis (standardized exam minus film scores) are reported in Table 5.4. The data presented again support the presence of four mood factors, with relative ordering of the dimensions--based on eigenvalues--following that of the control (film) condition: Surgency is overwhelmingly the most salient mood factor determined in this solution, with **Mastery/Self-Esteem**, **Aggression**, and **Sadness** each contributing a decreasing amount to the total data-variance.

Only one item of the PAMS is found to not be a marker in this dR-factor solution--that of **handsome (or) pretty**. As may be recalled, this **Mastery/Self-Esteem** item was also the most consistent cross-loader in the two principal components analyses. Further attention will be accorded this item in the next section.

The last result to be reported in this section is that of factor similarity. Data regarding factor congruence, or stability in this case since the same subjects were involved in both classroom conditions, are presented in Table 5.5. Congruence coefficients reached highly significant levels (p=.001) on all four dimensions when the exam and film factor solutions were analyzed. Coefficients in this table were tested against criteria set by Tucker, and Schneewind and Cattell (Cattell, 1978, p. 253 and pp. 568-569), with the rotated matrix representing factors in order of similarity. As can be seen from the transformation matrix, very little rotation of the exam structure was necessary in order to closely approximate that of the film. In fact, the presence of factor stability is further confirmed by this transformation matrix, where each column/row has only one element near the value of +1 and the rest near zero (criterion set by Schonemann and reported in Skakun, 1971).

Internal Consistency and Reliability

Although construct validity as assessed by principal components analysis would take into account intra factor-item correlations (loadings), it would not directly assess factor scale-item correlations.

Accordingly, tests for subscale homogeneity were carried out separately on the exam and film data. Table 5.6 reports those results. As was found in the factor analytic data, the PAMS Surgency subscale once more appeared to be the strongest mood measure. It attained the highest degrees of internal consistency, with Pearson product-moment coefficients all being well above .75[3]--in fact, only the like smiling item in the film condition, was found to be below .80. Likewise, all other intra scale-item correlations were seen to attain very respectable levels, with the average correlation for exam/film being .84/.81, .68/.69, .77/.73, and .74/.75 on the Surgency, Sadness, Aggression, and Mastery/Self-Esteem subscales, respectively.

The only relatively "poor" contributor was that of handsome (or) pretty (.66/.58 for exam/film) from the Mastery/Self-Esteem dimension--the one item which was also found to cause "problems" in the factor analyses. Needless to say, however, all of these intra scale-item correlations were significant at the .001 level.

Reliability measures for PAMS on the exam and film data are reported in Tables A.3 - A.6 of the Appendix. Once more, the Surgency subscale presented the most elevated coefficients with standardized item alpha attaining .895 for the exam condition and .869 for the film (Table A.3). A perusal of the item-total statistics indicated that all of the Surgency items were contributors to the subscale's alpha, and hence, were necessary in defining this mood scale.

The Sadness subscale is presented in Table A.4. Standardized item alphas for this measure were the lowest obtained in the Edmonton sample, with coefficients of .723 (exam) and .725 (film)--respectable values, nonetheless. Moreover, as was found with the Surgency subscale, all Sadness items contributed to increasing their associated reliability coefficients.

Table A.5 presents the Aggression subscale's alpha measurements. The exam data provided a standardized item alpha of .837, while the film data produced a slight decrease to .788; all Aggression items were found to be necessary in defining this mood scale.

The final set of reliability coefficients is presented in Table A.6. These data reveal that the Mastery/Self-Esteem mood scale may be once more affected by the handsome (or) pretty item. For even though this variable did not appear to have altered the alpha coefficient for the exam condition, it did produce a decrease in that measure for the film treatment:

Standardized item alpha for the exam was .802 (with item deletion producing a coefficent of .801), while the film data had a standardized alpha of .815, with an increased coefficient of .848 when handsome (or) pretty was removed. Additionally, the partial-alpha measures corroborated this variable's attenuating effect in the film data.

Table 5.7 presents data regarding the differentiation of state and trait measures as far as the PAMS subscales are concerned. Based on the idea that test-retest reliabilities should be fairly low for a mood scale, while internal consistency should be high, Howarth (1978) has provided an index which expresses this relationship:

μ=1-(Test-retest reliability/intra-scale homogeneity). As may be discerned from this equation, state measures should have mean values ranging from .375 to .750, with those falling below the .375 value being considered as trait measures. According to this criterion then, the first three PAMS subscales of Surgency, Sadness, and Aggression fall into that category, with only the Mastery/Self-Esteem[4] measure missing the mark.

C. Wetaskiwin-Sample Methodology: Morning vs Afternoon Condition

Mood data provided by the PAMS were collected on 372 students who were present in the four Wetaskiwin schools on May 9th, 1983. Grades three through six were represented in three of the schools (Norwood, Centennial, and Parkdale), while the fourth school (McMurdo) had only grades 4, 5, and 6 included in this study. All children within these classes who were present during either test administration were included in the conceptual data analyses. The 19 classes, divided by grade, sex, and time-of-school day resulted in the sample distribution presented in Table 5.8.

Procedure

In this single-day repeated measures design, all teachers involved were asked to pass out the Pre-Adolescent Mood Scale as the very first activity of the Monday morning--before their students had been exposed to the classroom environment for any appreciable amount of time, and after the children had been away from it for the two prior days of the weekend. Then, approximately one hour before school was out, and after the children had had a five-hour exposure to the experimental conditions, they were again administered this state measure. Due to the previously-noted effects of weather on mood, and in order to obviate the possibility of other confounding variables, all classes participated in these testings on the same day (May 9th, 1983) and at the same times (9:05 A.M. and 2:30 P.M.). The teacher-instruction form which accompanied each set of Pre-Adolescent Mood Scales may be found in Appendix E.

D. Wetaskiwin Sample Results

Even though the primary condition of concern for the criterion-related validation study on the Wetaskiwin sample was school-environment, it was considered more appropriate to do the construct validation study on the diurnal conditions of morning vs afternoon, since the children were present in their "home" schools for both of these testings. By looking at this combined group of students, an increased sample size would obtain, which would also increase the confidence we might have in the resulting factor structures. Accordingly, the morning and afternoon data from the participating schools were separately collapsed, thus allowing for factor analyses on ns of 370 and 372, respectively.

Factor Structure and Congruence

As was done with the Edmonton sample data, the 20

Pre-Adolescent Mood Scale items were intercorrelated for each of the conditions by means of the Pearson product-moment correlation coefficient; Tables D.3 & D.4 in the Appendix present these coefficients for morning and afternoon, respectively. Once more, the principal components orthogonal solution was closely matched by both the principal axis factoring, and the two oblique rotations, hence only the PC analyses will be reported.

Tables 5.9 and 5.10 present data regarding these factor solutions for the morning and afternoon conditions, respectively. As can be seen from this information, both times of day produced the same relative ordering of mood dimensions, with Surgency being most salient, followed by Mastery/Self-Esteem, Aggression, and Sadness. Nonetheless, there is a considerable difference noted between the testings in the amount of variance accounted for by the first and last factors: whereas the morning data produced a fair, but not extreme eigenvalue for Surgency in relation to the other dimensions, the afternoon data appeared to have inflated this value, with a resulting decrease in the Sadness eigenvalue being noted. In fact, if we were to adhere to the customary "eigenvalue > 1" criterion, the Sadness subscale would have been almost totally lost in the afternoon analysis. Nevertheless, because 1) my main interest in analyzing these data was to determine if clear factor structures would obtain from the four scales, and 2) the Sadness measure had been so robust in all of the other analyses, I considered this "slightly less than one" eigenvalue to be due more to random error than any real lack of structure in the data. This supposition appears to be confirmed by not only the fairly substantial values for the Sadness markers, but also by the result of the Scree test (Cattell, 1966b) on this afternoon data.

Marker variables for each factor were almost exclusively confined to their appropriate subscales, although several Sadness and Aggression items were found to also cross-load: For the morning structure, trapped and unwanted revealed loadings of greater than .35 on the Aggression dimension (Table 5.9), while upset, bad-tempered and like-hitting were negative cross-loaders on the afternoon Surgency dimension (Table 5.10). Furious was also found to cross-load in the afternoon, with its appearance being on the Sadness factor. These Wetaskiwin cross-loadings were considered to be in contrast to the Edmonton data, where only Mastery/Self-Esteem items were involved. As with the

Edmonton data, however, the factor-item correlations for the Wetaskiwin sample were found to be considerably lower than the loadings each item had with its respective dimension--that is, all except for the trapped item (Table 5.9). This variable was not only a marker for the Sadness dimension, but it also was highly loaded by the Aggression factor. Notwithstanding these few aberrant items, factor scale reliability was once more noted for the PAMS, with morning and afternoon data producing theta coefficients of .832 and .885 (Tables 5.9 and 5.10, respectively).

The results of alpha and maximum likelihood factoring on the morning and afternoon data are reported in Tables B.1 and B.2 in the Appendix. As can be seen from these factor solutions, the morning data (Table B.1) provides confirmation for the four mood dimensions, with factor salience and marker patterns following that of the PC morning analysis. This, however, is not the case for the afternoon data presented in Table B.2. Both Alpha and Rao's confirmatory FAs indicated the presence of three significant scales (eigenvalues > 1.00) for the Wetaskiwin afternoon data. This occurred due to the collapse of the unipolar Surgency and Aggression scales into a single bipolar factor.

Nonetheless, because all of the other analyses had presented four very clear and significant dimensions, a forced extraction of four factors was undertaken for these data also; to do so was considered legitimate in light of the fact that the eigenvalue for the last factor was extremely close to a value of 1. Additionally, most confirmatory FA programs ask for a specification of "nfactors" to extract, under the assumption that this analysis will be used to confirm or refute the presence of those dimensions. I, however, had been interested first in determining whether the unforced solutions would present my four hypothesized independent factors. This expectation was confirmed in six of the eight analyses (Edmonton and Wetaskiwin factoring), with the offending solutions being the ones under consideration now.

Table B.3 presents the confirmatory FA solutions obtained for the forced extraction of four factors from the afternoon data. As expected, these structures approximated that of the PC solution shown in Table 5.10, nonetheless, there was also a contrary occurrence: Whereas the PC analysis produced a Sadness factor which had an eigenvalue <1.0, both of the confirmatory factorings found it to have eigenvalues well above 1 (initial statistics λ=2.05, with Alpha λ= 3.18, and Rao's λ =4.5). In these solutions, the Aggression factor was the one which attained an initial eigenvalue of <1.0, while its Alpha λ equalled .898 and the Rao eigenvalue was 2.39. In light of the fact that the unforced conformatory analyses (Table B.2) produced a bipolar factor of Surgency/Aggression, it was not too surprising that they would separate into four independent dimensions. What was surprising, however, was the fact that Sadness would be so much stronger in its representation, since it had always maintained the lowest position in all previous analyses. Such a happenstance might indicate that the differential effects of the various school environments served to alter the basic structure[5] which had been found during the morning condition. Nevertheless, analyses of the individual confirmatory factorings for both the morning and afternoon data were seen to provide support for the four PAMS subscales. Moreover, data from the dR analysis, presented in Table 5.11, lend further credence to this assertion.

As was found in the Edmonton data, differential R-factors in the Wetaskiwin sample revealed the same order of factor salience: Surgency was the greatest contributor to the total data variance, followed by Mastery/Self-Esteem, Aggression, and Sadness. Unlike the Edmonton sample, however, only two items were found to be cross-loaders, while all items served as very strong markers for their respective factors. The two variables which had cross-loadings were from the Sadness (upset) and Aggression (bad-tempered) subscales; both of them were found to be negatively loaded by the Surgency factor. As may be recalled, these two items also cross-loaded on the afternoon Surgency dimension (Table 5.10). Thus, from this analysis, the Pre-Adolescent Mood Scale does indeed appear to be a state measure.

The last result to be reported in this section is that of factor similarity (stability) betwen the morning and afternoon data. Table 5.12 presents Tucker's coefficients for factor congruence ranging in value from .898 for the Aggression factor to .974 for that of Mastery/Self-Esteem; all four factor matches were found to be significantly similar at the .001 level. Additionally, the transformation matrix revealed very little rotation to be necessary for the Surgency and Mastery/Self-Esteem dimensions, while Aggression and Sadness required only a slightly greater amount. Hence, the presence of strong factor stability in the Wetaskiwin data appears to follow that found in the Edmonton sample.

Internal Consistency and Reliability

Tests for subscale homogeneity in the PAMS were separately carried out for the morning and afternoon administrations. Table 5.13 reports those results. Once more, the Surgency subscale attained the highest over-all degree of internal consistency, with Pearson product-moment coefficients all being well above .75. Likewise, all other intra scale-item correlations were seen to attain very respectable levels, with the average correlation for morning/afternoon being .79/.85, .73/.72, .67/.79, and .77/.79 on the Surgency, Sadness, Aggression, and Mastery/Self-Esteem subscales, respectively.

The only relatively "poor" contributor was that of bossy (.599) from the morning Aggression dimension. This finding was rather surprising considering that it was the afternoon testing which had appeared aberrant as far as the factors of Sadness and Aggression were concerned. Additionally, one should note the wide spread on the mean correlations obtained for Aggression between the first and second administration--.67 vs .79;

clearly something unusual was happening in this sample over the course of a day. More attention will be paid to this point in the Criterion-related Validation section of the manuscript. Needless to say, however, all of the subscale-item correlations attained p values of <.001.

Reliability measures for the PAMS on the Wetaskiwin morning and afternoon testings are reported in Tables B.4 - B.7 of the Appendix. Here too, the Surgency subscale presented the most elevated coefficients with standardized item alpha attaining .849 for the morning condition and .904 for the afternoon (Table B.4). All Surgency items were found to contribute to the subscale's alpha, and hence, were necessary in defining this mood scale.

The Sadness subscale is presented in Table B.5. Standardized item alphas for this measure were quite similar between the two administrations--.801 and .796, respectively--with all of the items being found necessary for increasing the Sadness reliability coefficients.

Table B.6 presents the Aggression subscale alpha and split-half measurements. As had been found in the internal consistency data, the morning sample once more produced aberrant results: its standardized item alpha was considerably lower than that of the afternoon sample--.699 vs .851--as was its partial alpha for "2 items in Part 1"; here the morning was found to produce an alpha of .323, while the afternoon provided a more "normal" .706. Nonetheless, no single item was seen to be responsible for these results, since all were found to contribute to an increase in the Aggression subscale's alpha coefficients.

The final set of reliability coefficients pertains to the Mastery/Self-Esteem subscale, and is presented in Table B.7. As was found in the Edmonton sample these data also reveal that this mood scale may have been "adversely" affected by the handsome (or) pretty item. Nevertheless, this was the first indication in the Wetaskiwin sample that this variable might pose a problem: No cross-factor loadings or weak internal consistency measurements were obtained for this item; it was, however, consistently lower in value than its cohort variables, albeit the values were very respectable. Morning alpha coefficients were found to be .824 and .833 for inclusion and deletion of this item, respectively, while the afternoon data produced alphas of .845 and .864--coefficients that were not too drastically different, but nonetheless improved, upon the removal of the handsome (or) pretty variable. Recommendations regarding this item will be presented in the Discussion Chapter of this dissertation.

Table 5.14 presents data regarding the JI index and its findings in relation to the PAMS subscales. For the Wetaskiwin sample, there appeared to be an indication that the Sadness and Mastery/Self-Esteem subscales might actually be tapping some aspect of trait since their indices obtained values of less than .375. Further exploration of this possibility will be undertaken in the Discussion Chapter to follow.

E. Edmonton vs Wetaskiwin Sample: Factor Structure Invariance

Because the main objective of this dissertation was to provide as comprehensive a validity study as possible, considering the constraints imposed by time and manpower (the author, alone), it was considered prudent to compare the factor structures obtained for the two population bases: If the presence of factor invariance across two diverse populations could be supported for the Pre-Adolescent Mood Scale, then it would provide further confirmation of its conceptual validity. Tables 5.15 through 5.18 present just such support.

As can be seen from the comparisons for the two Edmonton conditions against the Wetaskiwin morning data (Tables 5.15 & 5.16), Tucker's coefficients provide very strong evidence for the presence of cross-population factor congruence. Values range from a low of .9097 for the exam-vs-morning Aggression dimension, to a high of .9836 for the film-vs-morning Surgency factor. Moreover, the transformation matrix indicates that very little rotation was necessary in order to reach such significant congruence levels ($p < .001$).

Tables 5.17 and 5.18 provide similar, but even more robust confirmation of a stable PAMS factor structure: Values for Tucker's coefficient in these data range from .9560, again for the Aggression factor (film vs afternoon), to .9822 for that of film-vs-afternoon Sadness. A perusal of the two transformation matrices only further attests to the already strong evidence for the factor invariant properties of the Pre-Adolescent Mood Scale.

Notes for Chapter V

1. The Edmonton sample was concerned with both diurnal mood-effects, and those produced by two classroom activities (exam vs film), while the Wetaskiwin sample involved effects produced by four different school environments during the morning and afternoon hours. Moreover, consideration was also given to age (four grade levels in each sample) and gender-effects, thus providing a grand total of 96 cells for data analysis.

2. For orthogonal rotations, item-factor loadings are equal to item-factor correlations.

3. For sake of brevity, all correlations reported in this section have been rounded up or down from those actually presented in the tables.

4. One wonders whether the deletion of that "offending" Mastery/Self-Esteem item (handsome/ pretty) would drastically alter the μ index's classification of this PAMS mood scale. Support that such a result might obtain is given by the Edmonton dR-analysis which indicated that this item was the only one which was not a factor marker. Nonetheless, the Wetaskiwin dR-analysis did include it among the 20 marker-items for that factoring. Thus, further

research must be undertaken in this area before it is possible to make any such determination.

5. The morning condition may be considered a control treatment in the sense that the children were administered the PAMS as the first activity of the day, before any appreciable effects due to differing school environments could accrue.

TABLES FOR CHAPTER V

Table 5.1

Subject Distribution for Latin Square Design Edmonton Sample

Treatment Order	Grade 3	Grade 4	Grade 5	Grade 6	Total N
Exam-Film N	63 (four classes)	45 (four classes)	121 (six classes)	86 (four classes)	315
female n	28	21	64	37	150
male n	35	24	57	49	165
Film-Exam N	76 (four classes)	86 (four classes)	33 (three classes)	59 (four classes)	254
female n	28	43	19	31	121
male n	48	43	14	28	133
Total N	139 (eight classes)	131 (eight classes)	154 (nine classes)	145 (eight classes)	569

Table 5.2

Edmonton-Sample Factor Structure: Exam on Mood Scale

Varimax Rotated Factor Loadings

Factor 1			Factor 2			Factor 3			Factor 4		
PAMS Subscale: Surgency			PAMS Subscale: Aggression			PAMS Subscale: Mastery/Self-Esteem			PAMS Subscale: Sadness		
Eigenvalue = 5.671 % variance = 28.4* θ = .867[a]			Eigenvalue = 3.674 % variance = 18.4			Eigenvalue = 1.628 % variance = 8.1			Eigenvalue = 1.080 % variance = 5.4		
Factor Item	Factor Communality	Factor Loading	Factor Item	Factor Communality	Factor Loading	Factor Item	Factor Communality	Factor Loading	Factor Item	Factor Communality	Factor Loading
CHEERFUL	0.73320	0.81873			-0.19813			0.07449			-0.13446
GLAD	0.68669	0.75648			-0.25360			0.16432			-0.15203
JOYFUL	0.77295	0.84486			-0.19386			0.08815			-0.11748
LIKE SMILING	0.66883	0.77620			-0.19128			0.11531			-0.12828
WONDERFUL	0.63647	0.74847			-0.10819			0.19771			-0.15981
		-0.05924			-0.01432			0.01403	LONELY	0.53141	0.72629
		-0.11784			0.21577			-0.06285	SAD	0.56805	0.70969
		-0.10349			0.26594			0.02219	TRAPPED	0.40936	0.57222
		-0.06972			0.03059			0.08854	UNWANTED	0.50039	0.69768
		-0.23234			0.33832			-0.00649	UPSET	0.48646	0.56389
		-0.17233	BAD TEMPERED	0.61252	0.75352			-0.00869			0.12229
		-0.03161	BOSSY	0.54135	0.70805			0.19264			0.04370
		-0.18304	FURIOUS	0.62220	0.74888			0.07038			0.15139
		-0.24474	LIKE HITTING	0.65229	0.72377			0.16603			0.20246
		-0.22048	MEAN	0.63718	0.71120			0.18703			0.21834
		0.40651			0.08309	BRAVE	0.55305	0.61642			0.03037
		0.42487			0.00223	HANDSOME PRETTY	0.42666	0.49070			0.07314
		0.05588			0.17068	POWERFUL	0.65986	0.78862			-0.07536
		0.13498			0.10183	STRONG	0.68867	0.81243			0.00624
		0.04118			0.15280	TOUGH	0.66547	0.79575			0.08454

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* Cumulative % of variance = 60.3

[a] Coefficient theta = $(N/N-1)(1-{}^{1}/_{\lambda})$, where N represents the total number of variables and λ represents the first eigenvalue

Table 5.3

Edmonton-Sample Factor Structure: Film

Varimax Rotated Factor Loadings

Mood Item	Communality	Factor 1 Surgency	Factor 2 Mastery/Self-Esteem	Factor 3 Aggression	Factor 4 Sadness
		Eigenvalue = 5.039 % variance = 25.2* θ^a = .844	Eigenvalue = 3.692 % variance = 18.5	Eigenvalue = 1.756 % variance = 8.8	Eigenvalue = 1.179 % variance = 5.9
CHEERFUL	0.64922	0.75828	0.11768	-0.22642	-0.09546
GLAD	0.66008	0.77817	0.13067	-0.18543	-0.05545
JOYFUL	0.72044	0.82099	0.11617	-0.15037	-0.10154
LIKE SMILING	0.56927	0.73791	0.05807	-0.11023	-0.09609
WONDERFUL	0.65930	0.75311	0.11880	-0.08138	-0.26720
LONELY	0.49946	-0.01187	0.02136	0.05710	0.70399
SAD	0.64972	-0.20996	-0.02464	0.05752	0.77571
TRAPPED	0.37915	0.02643	-0.07843	0.31258	0.52401
UNWANTED	0.50614	-0.08209	0.10534	0.08642	0.69342
UPSET	0.51867	-0.29447	0.06994	0.23082	0.61139
BAD TEMPERED	0.58071	-0.25810	0.07227	0.70715	0.09387
BOSSY	0.55527	-0.02814	0.10324	0.73301	0.08075
FURIOUS	0.50170	-0.07884	0.05490	0.66753	0.21649
LIKE HITTING	0.53390	-0.20979	0.18084	0.65462	0.16930
MEAN	0.58065	-0.22909	0.23206	0.68382	0.08193
BRAVE	0.57150	0.30389	0.68265	0.08948	0.07167
HANDSOME PRETTY	0.33237	0.36002	0.43875	-0.04626	0.09006
POWERFUL	0.72392	0.06588	0.82711	0.18817	0.00775
STRONG	0.76225	0.04737	0.86696	0.08862	-0.02330
TOUGH	0.71185	0.02596	0.80302	0.25750	-0.00565

*Cumulative % of variance = 58.3

[a] Coefficient theta = $(N/N-1)(1-1/\lambda_1)$, where N represents the total number of variables and λ_1 represents the first eigenvalue

Table 5.4

Edmonton-Sample Factor Structure: dR-Factoring

Varimax Rotated Factor Loadings

Mood Item	Communality	Factor 1 Surgency	Factor 2 Mastery/Self-Esteem	Factor 3 Aggression	Factor 4 Sadness
		Eigenvalue = 4.667	Eigenvalue = 2.086	Eigenvalue = 1.497	Eigenvalue = 1.139
		% variance = 23.3*	% variance = 10.4	% variance = 7.5	% variance = 5.7
		θ^a = .827			
SUR 1	0.58048	0.74893	-0.01240	-0.11644	-0.07659
SAD 1	0.48511	0.14486	-0.13181	0.07906	0.66371
AGG 1	0.47397	-0.34422	0.07835	0.58560	0.08010
SEM 1	0.26669	0.32049	0.37883	0.11558	0.08428
SUR 2	0.57509	0.73924	0.05799	-0.14675	-0.06098
SAD 2	0.51709	-0.26300	0.00608	0.18117	0.64425
AGG 2	0.57126	-0.02615	-0.07552	0.73986	0.13218
SEM 2	0.16727	0.29189	0.20056	-0.10434	0.17595
SUR 3	0.55512	0.71777	0.05357	-0.14794	-0.12316
SAD 3	0.34716	-0.10835	0.05211	0.08555	0.57043
AGG 3	0.42194	-0.33762	0.22238	0.50416	0.06572
SEM 3	0.39985	0.12363	0.58428	0.17209	-0.11650
SUR 4	0.46216	0.58370	0.13924	-0.28623	-0.14190
SAD 4	0.50636	-0.29183	0.09413	-0.37915	0.51824
AGG 4	0.51594	-0.40234	0.32156	0.44976	0.21995
SEM 4	0.52198	0.09845	0.71270	0.03885	0.05327
SUR 5	0.45670	0.61262	0.02675	-0.03066	-0.28238
SAD 5	0.48954	-0.41473	0.25062	0.23302	0.44770
AGG 5	0.48676	-0.39758	0.35683	0.44870	-0.00490
SEM 5	0.58818	-0.13082	0.74963	-0.09371	0.01851

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* Cumulative % of variance = 46.9

[a] Coefficient theta = $(N/N-1)(1-^{1}/\lambda_1)$, where N represents the total number of variables and λ_1 represents the first eigenvalue

Table 5.5

Edmonton-Sample Factor Similarity: Exam vs Film

ROTATED MATRIX A **Exam**

	1	2	3	4
1	0.8243	0.0802	-0.1784	-0.1245
2	0.7827	0.1892	-0.2348	-0.1488
3	0.8498	0.0945	-0.1737	-0.1074
4	0.7811	0.1207	-0.1724	-0.1189
5	0.7512	0.2019	-0.0894	-0.1828
6	-0.0710	0.0292	-0.0230	0.7248
7	-0.1338	-0.0492	0.2068	0.7110
8	-0.1180	0.0328	0.2578	0.5724
9	-0.0827	0.1028	0.0221	0.6946
10	-0.2480	0.0028	0.3273	0.5833
11	-0.1909	-0.0102	0.7482	0.1271
12	-0.0499	0.1912	0.7072	0.0480
13	-0.2028	0.0897	0.7433	0.1842
14	-0.2858	0.1658	0.7188	0.2019
15	-0.2418	0.1875	0.7048	0.2178
16	0.3981	0.8207	0.0838	0.0244
17	0.4187	0.4983	0.0123	0.0894
18	0.0457	0.7868	0.1749	-0.0889
19	0.1248	0.8134	0.1071	-0.0083
20	0.0287	0.7874	0.1881	0.0883

MATRIX B **Film**

	1	2	3	4
1	0.7583	0.1177	-0.2284	-0.0855
2	0.7782	0.1307	-0.1854	-0.0584
3	0.8210	0.1162	-0.1806	-0.1018
4	0.7378	0.0861	-0.1102	-0.0881
5	0.7831	0.1188	-0.0814	-0.2872
6	-0.0119	0.0214	0.0571	0.7040
7	-0.2100	-0.0248	0.0578	0.7757
8	0.0284	-0.0784	0.3128	0.8240
9	-0.0821	0.1053	0.0884	0.6834
10	-0.2845	0.0859	0.2308	0.6114
11	-0.2581	0.0723	0.7071	0.0838
12	-0.0281	0.1032	0.7330	0.0807
13	-0.0788	0.0849	0.8875	0.2185
14	-0.2098	0.1808	0.8546	0.1893
15	-0.2291	0.2321	0.8838	0.0819
16	0.3038	0.8827	0.0895	0.0717
17	0.3800	0.4386	-0.0453	0.0901
18	0.0858	0.8271	0.1882	0.0078
19	0.0474	0.8870	0.0888	-0.0233
20	0.0260	0.8030	0.2875	-0.0988

MATRIX OF TUCKER COEFFICIENTS[a] FOR MATRICES B AND ROTATED A

	1	2	3	4
1	0.9897	0.2908	-0.4023	-0.3370
2	0.2704	0.9898	0.2865	0.0472
3	-0.4038	0.2876	0.9873	0.4083
4	-0.3183	0.0481	0.3858	0.9844

TRANSFORMATION MATRIX[b]

	1	2	3	4
1	0.9995	0.0099	0.0221	0.0185
2	-0.0222	-0.0028	0.9997	0.0100
3	-0.0098	0.9997	0.0029	-0.0218
4	-0.0184	0.0217	-0.0103	0.9998

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[a] Critical $p \leq .05$ value of Tucker's coefficient for 20 in-common variables on four factors is ± .63; significance levels other than $p \leq .05$ are not noted in Tucker's table. The Schneewind-Cattell table lists critical values for .01, and .001 levels of significance as being ± .64 and ± .78.

[b] Schonemann's Orthogonal Procrustes Solution maintains significant factor stability if each row or column of the transformation matrix has one element near the value of ± 1 and the rest near zero (Skakun, 1971).

Table 5.6

Edmonton-Sample Internal Consistency: Item-Scale Correlation

Exam Items on Scales (N=504)

Surgency Scale	Sadness Scale	Aggression Scale	Mastery/Self-Esteem Scale
1 .8536	1 .6764	1 .7420	1 .7283
2 .8291	2 .7267	2 .6921	2 .6605
3 .8762	3 .6581	3 .7756	3 .7658
4 .8283	4 .6641	4 .8297	4 .7818
5 .8068	5 .6899	5 .8001	5 .7676
$\bar{x}r$ .8388	$\bar{x}r$ .6830	$\bar{x}r$ .7679	$\bar{x}r$ .7408

Film Items on Scales (N=451)

Surgency Scale	Sadness Scale	Aggression Scale	Mastery/Self-Esteem Scale
1 .8063	1 .6995	1 .7270	1 .7408
2 .8152	2 .7690	2 .6823	2 .5766
3 .8472	3 .6036	3 .6705	3 .8085
4 .7719	4 .6903	4 .7850	4 .8248
5 .8037	5 .6897	5 .7907	5 .8046
$\bar{x}r$ .8089	$\bar{x}r$ .6904	$\bar{x}r$ .7311	$\bar{x}r$ .7511

Table 5.7

μ Index[a] for Specification of State Scales: Edmonton Sample

PAMS Subscale	EXAM CONDITION test-retest[b] reliability	intra-scale[c] homogeneity	μ index	FILM CONDITION test-retest reliability	intra-scale homogeneity	μ index
Surgency	.5076	.8951	.433	.5076	.8687	.416
Sadness	.4506	.7231	.377	.4506	.7277	.381
Aggression	.4519	.8369	.460	.4519	.7877	.426
Mastery/ Self-Esteem	.7393	.8020	.078	.7393	.8475	.128

[a] μ=1-(index of test-retest reliability/index of intra-scale homogeneity); developed by Dr. E. Howarth and presented in "The μ Index for Differentiation of State and Trait Scales", **Psychological Reports**, 1978, 43, 474.

[b] Test-retest reliability ascertained by Pearson Product-moment Correlation Coefficient for exam and film.

[c] Intra-scale homogeneity ascertained by Standard Item Alpha.

Table 5.8

Subject Distribution for Repeated-Measures Design Wetaskiwin Sample

Time of School Day	Grade				Total N
	3	4	5	6	
	(three classes)	(five classes)	(five classes)	(six classes)	
Morning N	56	105	98	111	370
female n	23	55	47	54	179
male n	33	50	51	57	191
Afternoon N	56	106	97	113	372
female n	23	55	47	56	181
male n	33	51	50	57	191

Table 5.9

Wetaskiwin-Sample Factor Structure: Morning

Varimax Rotated Factor Loadings

Mood Item	Communality	Factor 1 Surgency	Factor 2 Mastery/Self-Esteem	Factor 3 Aggression	Factor 4 Sadness
		Eigenvalue = 4.775 % variance = 23.9* $\theta^a = .832$	Eigenvalue = 3.408 % variance = 17.0	Eigenvalue = 2.050 % variance = 10.3	Eigenvalue = 1.201 % variance = 6.0
CHEERFUL	0.52328	0.78108	0.02224	-0.09567	-0.05883
GLAD	0.81499	0.78499	0.15195	-0.01898	-0.08040
JOYFUL	0.70732	0.82662	0.10452	-0.08862	-0.07232
LIKE SMILING	0.62277	0.74817	0.10876	-0.23280	0.03820
WONDERFUL	0.58115	0.68826	0.18785	-0.20088	-0.20127
LONELY	0.57126	0.00837	-0.02707	0.22412	0.72127
SAD	0.59608	-0.19153	0.02200	0.01970	0.81150
TRAPPED	0.47807	-0.00919	-0.05241	0.58483	0.39845
UNWANTED	0.57278	0.08317	-0.09057	0.40407	0.83032
UPSET	0.58444	-0.24246	0.03345	0.27072	0.67176
BAD TEMPERED	0.38695	-0.28382	0.04978	0.49288	0.21081
BOSSY	0.27976	-0.00389	0.13832	0.58616	0.05761
FURIOUS	0.34683	-0.08182	0.03408	0.49787	0.30447
LIKE HITTING	0.53840	-0.28736	0.08203	0.66012	0.06230
MEAN	0.57045	-0.17133	0.08978	0.73283	0.11848
BRAVE	0.51181	0.18309	0.67759	0.03423	0.13368
HANDSOME PRETTY	0.53578	0.11489	0.68485	-0.18758	0.20385
POWERFUL	0.71284	0.08094	0.81845	0.16880	-0.08412
STRONG	0.73407	0.11804	0.82552	0.10306	-0.17008
TOUGH	0.68212	0.02708	0.78883	0.19817	-0.18028

*Cumulative % of variance = 57.2

[a] Coefficient theta = $(N/N-1)(1-{}^{1}/\lambda_{1})$, where N represents the total number of variables and λ_1 represents the first eigenvalue

Table 5.10

Wetaskiwin-Sample Factor Structure: Afternoon

Varimax Rotated Factor Loadings

Mood Item	Communality	Factor 1 Surgency	Factor 2 Mastery/Self-Esteem	Factor 3 Aggression	Factor 4 Sadness
		Eigenvalue = 6.283 % variance = 31.4*	Eigenvalue = 3.582 % variance = 17.9	Eigenvalue = 2.056 % variance = 10.3	Eigenvalue = .945 % variance = 4.7
		θ^a = .885			
CHEERFUL	0.76438	0.82860	0.08407	-0.28845	-0.07028
GLAD	0.68285	0.75768	0.18873	-0.28800	-0.07726
JOYFUL	0.80255	0.84832	0.19002	-0.24[illegible]8	-0.02723
LIKE SMILING	0.64821	0.78836	-0.01825	-0.22356	-0.07432
WONDERFUL	0.72080	0.78455	0.18740	-0.12782	-0.22838
LONELY	0.55208	0.07158	-0.08275	0.05461	0.74168
SAD	0.58544	-0.08380	-0.14850	0.28092	0.66874
TRAPPED	0.50418	-0.21615	0.18468	-0.03831	0.84870
UNWANTED	0.51887	-0.04863	-0.08791	0.17111	0.78113
UPSET	0.68832	-0.40547	0.03714	0.22458	0.61882
BAD TEMPERED	0.56111	-0.38747	0.14285	0.67218	0.18308
BOSSY	0.65742	-0.21806	0.07510	0.77785	0.00547
FURIOUS	0.56238	-0.32836	0.12861	0.57763	0.36324
LIKE HITTING	0.58555	-0.38180	0.16073	0.61082	0.23562
MEAN	0.71114	-0.22416	0.18570	0.78825	0.20384
BRAVE	0.63853	0.12403	0.78081	0.08085	0.02778
HANDSOME PRETTY	0.44611	0.17713	0.62853	-0.12952	-0.02308
POWERFUL	0.67588	0.01812	0.77843	0.28877	-0.00183
STRONG	0.74488	0.08625	0.88170	0.17284	-0.04848
TOUGH	0.70217	-0.01871	0.81883	0.17284	-0.03713

*Cumulative % of variance = 64.3

[a] Coefficient theta = $(N/N-1)(1-1/\lambda_1)$, where **N** represents the total number of variables and λ_1 represents the first eigenvalue

Table 5.11

Wetaskiwin-Sample Factor Structure: dR-Factoring

Varimax Rotated Factor Loadings

Mood Item	Communality	Factor 1 Surgency	Factor 2 Mastery/Self-Esteem	Factor 3 Aggression	Factor 4 Sadness
		Eigenvalue = 4.969 % variance = 24.8*	Eigenvalue = 2.512 % variance = 12.6	Eigenvalue = 1.380 % variance = 6.9	Eigenvalue = 1.151 % variance = 5.8
		θ^a = .841			
SUR 1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SAD 1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AGG 1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SEM 1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SUR 2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SAD 2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AGG 2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SEM 2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SUR 3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SAD 3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AGG 3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SEM 3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SUR 4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SAD 4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AGG 4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SEM 4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SUR 5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SAD 5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AGG 5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SEM 5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

*Cumulative % of variance = 50.1

[a] Coefficient theta = $(N/N-1)(1-1/\lambda_1)$, where N represents the total number of variables and λ_1 represents the first eigenvalue

Table 5.12

Wetaskiwin-Sample Factor Similarity: Afternoon vs Morning

ROTATED MATRIX A

Afternoon

	1	2	3	4
1	0.8240	0.0808	-0.2780	-0.0817
2	0.7883	0.1882	-0.2835	-0.0788
3	0.8505	0.1342	-0.2424	-0.0431
4	0.7837	-0.0310	-0.2351	-0.0805
5	0.7742	0.1783	-0.1873	-0.2801
6	0.1189	-0.0861	0.1886	0.7184
7	-0.0245	-0.1750	0.3814	0.8232
8	-0.1880	0.1744	0.0788	0.8837
9	-0.0013	-0.1121	0.2888	0.7238
10	-0.3838	0.0251	0.3218	0.5888
11	-0.3880	0.1281	0.8884	0.1010
12	-0.2200	0.0585	0.7718	-0.1025
13	-0.3052	0.1080	0.8315	0.2807
14	-0.2484	0.1483	0.6489	0.1824
15	-0.2208	0.1727	0.7881	0.0884
16	0.1483	0.7737	0.0818	0.0341
17	0.1880	0.8277	-0.1088	-0.0021
18	0.0288	0.7868	0.2832	-0.0300
19	0.0843	0.8347	0.1824	-0.0838
20	0.0038	0.8140	0.1834	-0.0472

MATRIX B

Morning

	1	2	3	4
1	0.7811	0.0222	-0.0887	-0.0588
2	0.7849	0.1820	-0.0170	-0.0804
3	0.8288	0.1045	-0.0885	-0.0723
4	0.7452	0.1084	-0.2228	0.0282
5	0.8893	0.1878	-0.2007	-0.3013
6	0.0084	-0.0271	0.2241	0.7213
7	-0.1818	0.0220	0.0187	0.8118
8	-0.0082	-0.0524	0.5844	0.3885
9	0.0832	-0.0807	0.4041	0.8203
10	-0.2425	0.0334	0.2707	0.6717
11	-0.2638	0.0488	0.6826	0.2108
12	-0.0026	0.1363	0.8842	0.0878
13	-0.0818	0.0341	0.8880	0.3045
14	-0.2874	0.0420	0.8801	0.0823
15	-0.1713	0.0888	0.7228	0.1185
16	0.1821	0.8778	0.0343	0.1228
17	0.1180	0.8848	-0.1878	0.2038
18	0.0808	0.8184	0.1889	-0.0841
19	0.1180	0.8288	0.1021	-0.1701
20	0.0270	0.7888	0.1882	-0.1802

MATRIX OF TUCKER COEFFICIENTS[a] FOR MATRICES B AND ROTATED A

	1	2	3	4
1	0.8710	0.2100	-0.4542	-0.2580
2	0.1888	0.8741	0.3088	-0.0884
3	-0.3787	0.2287	0.8877	0.5288
4	-0.2348	-0.0848	0.4720	0.8471

TRANSFORMATION MATRIX[b]

	1	2	3	4
1	0.9872	-0.0283	-0.0027	-0.0888
2	0.0298	0.9987	0.0383	0.0182
3	-0.0081	-0.0318	0.9888	-0.1888
4	0.0872	-0.0288	0.1880	0.9848

---

[a] Critical p ≤ .05 value of Tucker's coefficient for 20 in-common variables on four factors is ± .63; significance levels other than p ≤ .05 are not noted in Tucker's table. The Schneewind-Cattell table lists critical values for .01, and .001 levels of significanceas being ± .64 and ± .78.

[b] Schonemann's Orthogonal Procrustes Solution maintains significant factor stability if each row or column of the transformation matrix has one element near the value of ± 1 and the rest near zero (Skakun, 1971).

Table 5.13

Wetaskiwin Sample Internal Consistency: Item-Scale Correlations

Morning Items on Scales (N=370)

	Surgency Scale	Sadness Scale	Aggression Scale	Mastery/Self-Esteem Scale
1	.7814	.7515	.6405	.6960
2	.7753	.7159	.5987	.6597
3	.8350	.6809	.6263	.8331
4	.7828	.7642	.7426	.8377
5	.7740	.7393	.7504	.8042
$\bar{x}r$	.7897	.7304	.6717	.7661

Afternoon Items on Scales (N=372)

	Surgency Scale	Sadness Scale	Aggression Scale	Mastery/Self-Esteem Scale
1	.8740	.7016	.7954	.7807
2	.8381	.7461	.7297	.6412
3	.8947	.6505	.7779	.8139
4	.8077	.7708	.8077	.8632
5	.8325	.7399	.8426	.8302
$\bar{x}r$	.8494	.7218	.7907	.7858

Table 5.14

μ Index[a] for Specification of State Scales: Wetaskiwin Sample

PAMS Subscale	MORNING TESTING test-retest reliability[b]	intra-scale homogeneity[c]	μ index	AFTERNOON TESTING test-retest reliability	intra-scale homogeneity	μ index
Surgency	.4136	.8493	.513	.4136	.9035	.542
Sadness	.5245	.7816	.329	.5245	.7704	.319
Aggression	.4189	.6989	.401	.4189	.8509	.508
Mastery/ Self-Esteem	.6673	.8335	.199	.6673	.8644	.228

[a] μ = 1-(index of test-retest reliability/index of intra-scale homogeneity); developed by Dr. E. Howarth and presented in "The μ Index for Differentiation of State and Trait Scales", Psychological Reports, 1978, 43, 474.

[b] Test-retest reliability ascertained by Pearson Product-moment Correlation Coefficient for exam and film.

[c] Intra-scale homogeneity ascertained by Standard Item Alpha.

Table 5.15

Factor Similarity on Conditions: Edmonton Exam vs Wetaskiwin Morning

ROTATED MATRIX A **Exam**

	1	2	3	4
1	0.8189	0.1218	-0.1875	-0.1120
2	0.7530	0.2080	-0.2451	-0.1277
3	0.8439	0.1373	-0.1813	-0.0853
4	0.7739	0.1801	-0.1810	-0.1075
5	0.7399	0.2395	-0.1007	-0.1488
6	-0.0884	0.0230	0.0381	0.7243
7	-0.1283	-0.0594	0.2844	0.6915
8	-0.1163	0.0235	0.3051	0.5493
9	-0.0848	0.0959	0.0809	0.6910
10	-0.2467	-0.0134	0.3734	0.5348
11	-0.1801	-0.0234	0.7561	0.0844
12	-0.0594	0.1852	0.7095	-0.0127
13	-0.2057	0.0557	0.7538	0.0822
14	-0.2730	0.1488	0.7317	0.1428
15	-0.2600	0.1714	0.7211	0.1592
16	0.3872	0.6389	0.0984	0.0172
17	0.3942	0.6159	0.0208	0.0884
18	0.0085	0.7877	0.1705	-0.1018
19	0.0849	0.8181	0.1095	-0.0147
20	-0.0192	0.7898	0.1842	0.0588

MATRIX B **Morning**

	1	2	3	4
1	0.7811	0.0222	-0.0957	-0.0898
2	0.7649	0.1520	-0.0170	-0.0804
3	0.8288	0.1045	-0.0886	-0.0723
4	0.7452	0.1088	-0.2328	0.0382
5	0.6893	0.1878	-0.2007	-0.2013
6	0.0084	-0.0271	0.2241	0.7213
7	-0.1915	0.0220	0.0197	0.8115
8	-0.0092	-0.0524	0.5848	0.3965
9	0.0832	-0.0907	0.4041	0.6303
10	-0.2425	0.0334	0.2707	0.6717
11	-0.2839	0.0468	0.4926	0.2108
12	-0.0038	0.1363	0.5862	0.0878
13	-0.0818	0.0341	0.4980	0.3045
14	-0.2874	0.0820	0.6801	0.0823
15	-0.1713	0.0898	0.7228	0.1185
16	-0.1631	0.8778	0.0342	0.1238
17	0.1180	0.8849	-0.1978	0.2035
18	0.0809	0.8164	0.1889	-0.0841
19	0.1180	0.8285	0.1021	-0.1701
20	0.0270	0.7898	0.1892	-0.1893

MATRIX OF TUCKER'COEFFICIENTS FOR MATRICES B AND ROTATED A

	1	2	3	4
1	0.9728	0.3180	-0.4109	-0.2784
2	0.2888	0.9800	0.1928	-0.0440
3	-0.4238	0.2177	0.9087	0.5118
4	-0.2443	-0.0423	0.4384	0.9447

TRANSFORMATION MATRIX

	1	2	3	4
1	0.9979	0.0587	0.0239	0.0107
2	-0.0226	-0.0085	0.9970	-0.0741
3	-0.0587	0.9981	0.0058	-0.0182
4	-0.0135	0.0170	0.0739	0.9970

Table 5.16

Factor Similarity on Conditions: Edmonton Film vs Wetaskiwin Morning

ROTATED MATRIX A **Film**

	1	2	3	4
1	0.7536	0.1514	-0.2271	-0.0622
2	0.7730	0.1848	-0.1823	-0.0484
3	0.8156	0.1521	-0.1514	-0.0981
4	0.7347	0.0902	-0.1121	-0.0837
5	0.7452	0.1519	-0.0989	-0.2887
6	-0.0058	0.0179	0.1229	0.8887
7	-0.2008	-0.0388	0.1281	0.7882
8	0.0328	-0.0813	0.3800	0.4918
9	-0.0797	0.0987	0.1511	0.8835
10	-0.2928	0.0537	0.2851	0.5907
11	-0.2864	0.0561	0.7111	0.0304
12	-0.0384	0.0985	0.7378	0.0124
13	-0.0849	0.0461	0.8848	0.1641
14	-0.2214	0.1687	0.8870	0.1102
15	-0.2441	0.2171	0.8881	0.0209
16	0.2748	0.8838	0.1031	0.0818
17	0.3428	0.4525	-0.0315	0.0812
18	0.0283	0.8278	0.1944	-0.0079
19	0.0987	0.8878	0.0925	-0.0281
20	-0.0104	0.8018	0.2918	-0.0272

MATRIX B **Morning**

	1	2	3	4
1	0.7811	0.0222	-0.0857	-0.0588
2	0.7649	0.1520	-0.0170	-0.0804
3	0.8268	0.1045	-0.0888	-0.0723
4	0.7452	0.1088	-0.2328	0.0382
5	0.6893	0.1878	-0.2007	-0.2013
6	0.0084	-0.0271	0.2241	0.7213
7	-0.1915	0.0220	0.0197	0.8115
8	-0.0092	-0.0524	0.5648	0.3865
9	0.0832	-0.0907	0.4041	0.6303
10	-0.2425	0.0334	0.2707	0.6717
11	-0.2539	0.0488	0.4928	0.2109
12	-0.0038	0.1353	0.5882	0.0578
13	-0.0818	0.0341	0.4980	0.3045
14	-0.2574	0.0820	0.8801	0.0823
15	-0.1713	0.0898	0.7226	0.1185
16	0.1831	0.8775	0.0342	0.1328
17	0.1150	0.8849	-0.1978	0.2039
18	0.0808	0.8184	0.1888	-0.0841
19	0.1150	0.8285	0.1021	-0.1701
20	0.0270	0.7888	0.1882	-0.1803

MATRIX OF TUCKER COEFFICIENTS FOR MATRICES B AND ROTATED A

	1	2	3	4
1	0.9838	0.2813	-0.3723	-0.2813
2	0.2531	0.9764	0.2172	-0.0304
3	-0.3801	0.2288	0.9406	0.4815
4	-0.2418	-0.0281	0.4182	0.9857

TRANSFORMATION MATRIX

	1	2	3	4
1	0.9990	0.0421	0.0085	-0.0118
2	-0.0422	0.9991	0.0069	0.0034
3	-0.0093	-0.0070	0.9958	-0.0937
4	0.0109	-0.0038	0.0936	0.9955

Table 5.17

Factor Similarity on Conditions: Edmonton Exam vs Wetaskiwin Afternoon

ROTATED MATRIX A

Afternoon

	1	2	3	4
1	0.8112	-0.3146	0.0086	-0.0847
2	0.7512	-0.3269	0.1188	-0.0883
3	0.8433	-0.2862	0.0879	-0.0619
4	0.7480	-0.2707	-0.0723	-0.0906
5	0.7820	-0.1834	0.1305	-0.2418
6	0.0839	0.0786	-0.0905	0.7340
7	-0.0383	0.3184	-0.1752	0.8732
8	-0.1775	0.0135	0.1875	0.8813
9	-0.0210	0.2020	-0.1112	0.7517
10	-0.3868	0.2751	0.0484	0.8188
11	-0.3114	0.7061	0.1376	0.1874
12	-0.1878	0.7810	0.0853	-0.0214
13	-0.2730	0.8183	0.1189	0.3400
14	-0.3058	0.8488	0.1854	0.2226
15	-0.1880	0.7875	0.1738	0.1809
16	0.1881	0.0801	0.7821	0.0386
17	0.2288	-0.1117	0.8170	-0.0102
18	0.0883	0.3030	0.7876	0.0013
19	0.1473	0.2047	0.8243	-0.0412
20	0.0852	0.2084	0.8085	-0.0279

MATRIX B

Exam

	1	2	3	4
1	0.8187	-0.1881	0.0745	-0.1345
2	0.7565	-0.2536	0.1843	-0.1820
3	0.8449	-0.1839	0.0882	-0.1175
4	0.7762	-0.1813	0.1153	-0.1283
5	0.7484	-0.1082	0.1977	-0.1598
6	-0.0592	-0.0143	0.0140	0.7263
7	-0.1176	0.2158	-0.0626	0.7097
8	-0.1035	0.2659	0.0222	0.5722
9	-0.0697	0.0306	0.0885	0.8977
10	-0.2323	0.3383	-0.0065	0.5839
11	-0.1723	0.7535	-0.0090	0.1223
12	-0.0318	0.7061	0.1928	0.0437
13	-0.1830	0.7489	0.0704	0.1614
14	-0.2447	0.7238	0.1660	0.2026
15	-0.2205	0.7113	0.1870	0.2183
16	0.4085	0.0631	0.8184	0.0304
17	0.4248	0.0022	0.6807	0.0731
18	0.0588	0.1707	0.7868	-0.0784
19	0.1350	0.1018	0.8124	0.0062
20	0.0412	0.1828	0.7886	0.0868

MATRIX OF TUCKER COEFFICIENTS FOR MATRICES B AND ROTATED A

	1	2	3	4
1	0.9738	-0.4875	0.2800	-0.3116
2	-0.5147	0.9638	0.2703	0.4407
3	0.2059	0.2779	0.9838	0.0058
4	-0.2202	0.4515	0.0055	0.9805

TRANSFORMATION MATRIX

	1	2	3	4
1	0.9940	-0.0571	-0.0872	-0.0342
2	0.0905	0.0453	0.9946	0.0208
3	0.0514	0.9984	-0.0491	-0.0480
4	0.0348	0.0430	-0.0284	0.9981

Table 5.18

Factor Similarity on Conditions: Edmonton Film vs Wetaskiwin Afternoon

```
ROTATED MATRIX  A
                              Afternoon
            1          2          3          4

  1      0.8229     0.0087    -0.2824    -0.0881
  2      0.7822     0.1211    -0.2883    -0.0897
  3      0.8530     0.0825    -0.2538    -0.0448
  4      0.7888    -0.0894    -0.2387    -0.0902
  5      0.7872     0.1321    -0.1532    -0.2447
  6      0.0816    -0.0748     0.0815     0.7358
  7     -0.0489    -0.1588     0.3143     0.8775
  8     -0.1798     0.1861     0.0013     0.8577
  9     -0.0278    -0.0847     0.1985     0.7844
 10     -0.3778     0.0588     0.2874     0.8189
 11     -0.3403     0.1485     0.8898     0.1874
 12     -0.1894     0.0834     0.7831    -0.0184
 13     -0.2883     0.1283     0.8011     0.3400
 14     -0.3325     0.1848     0.8313     0.2223
 15     -0.2017     0.1844     0.7772     0.1803
 16      0.1885     0.7850     0.0874     0.0228
 17      0.2234     0.8178    -0.1110    -0.0222
 18      0.0783     0.7828     0.2888    -0.0118
 19      0.1308     0.8278     0.1884    -0.0858
 20      0.0485     0.8112     0.2001    -0.0419
```

```
MATRIX B
                              Film
            1          2          3          4

  1      0 7583     0 1177    -0 2284    -0 0855
  2      0 7782     0.1307    -0 1854    -0.0554
  3      0.8210     0 1182    -0 1504    -0 1018
  4      0 7379     0.0581    -0 1102    -0.0881
  5      0 7531     0.1188    -0 0884    -0 2872
  6     -0.0119     0 0214     0 0571     0 7040
  7     -0 2100    -0.0248     0 0575     0 7787
  8      0.0284    -0 0784     0 3128     0 5240
  9     -0.0821     0 1053     0.0884     0.8834
 10     -0 2945     0.0899     0 2308     0.8114
 11     -0.2581     0 0723     0.7071     0 0838
 12     -0.0281     0 1032     0.7330     0 0807
 13     -0.0788     0.0549     0 8875     0.2188
 14     -0 2088     0 1808     0.8548     0 1883
 15     -0 2281     0.2321     0.8838     0 0818
 16      0.3038     0.8827     0 0895     0.0717
 17      0 3800     0.4388    -0.0483     0.0801
 18      0.0858     0.8271     0 1882     0 0078
 19      0.0474     0 8870     0 0888    -0.0233
 20      0.0280     0.8030     0.2878    -0.0058
```

```
MATRIX OF TUCKER COEFFICIENTS FOR  MATRICES B AND     ROTATED  A

            1          2          3          4

  1      0 9892     0 2103    -0 4838    -0 3130
  2      0 2066     0 8821     0 3108     0 0119
  3     -0 4887     0 3207     0 9588     0 4188
  4     -0 3133     0 0121     0 4145     0 8822
```

```
TRANSFORMATION  MATRIX

            1          2          3          4

  1      0.9983    -0.0778    -0.0187    -0.0328
  2      0.0784     0.9963     0.0253     0.0021
  3      0.0125    -0.0303     0.9984    -0.0413
  4      0.0331    -0.0082     0.0407     0.9988
```

VI. CRITERION-RELATED VALIDATION:
METHODOLOGY AND RESULTS

In line with the previously-discussed research prescription of factor analyses first, and then analyses of variance (Chapters IV & V), this chapter will be concerned with the second step. Nonetheless, its organization will follow that of the construct validation chapter, with methodology and results for the Edmonton sample being presented in the initial section, while those for the Wetaskiwin sample will comprise the latter section.

A. Edmonton-Sample Methodology:

Exam vs Film Condition

Subject Sample

Although 569 subjects were involved in at least one of the two conditions under consideration (please refer to Table 5.1 for this sample distribution), student absences and incomplete data brought this total down to 474 for the repeated-measures analyses of variance. Table 6.1 presents this new subject distribution based on collapsed treatment-order. Additionally, information regarding the total number of subjects in each condition is also included. As can be seen from this table, 504 students were used in the exam analyses, while 474 were used in those for the film.

Procedure

Children in the 33 Edmonton classes individually self-administered the Pre-Adolescent Mood Scale twice during the third week of May--once, just prior to an exam, and once, just prior to an in-class film (order of administration was counter-balanced for each grade). Convenient times which complied with the exam-movie restriction for order of presentation were arranged by each instructor, resulting in the following sample distribution for the four school-day periods:

1) Prior to morning recess--
   237 exam/100 film students
2) Following morning recess--
   97 exam/96 film students
3) Prior to afternoon recess--
   109 exam/127 film students
4) Following afternoon recess--
   55 exam/123 film students

Analyses regarding both classroom-condition and grade/gender influences will be found in the empirical results section to follow. Additionally, a portion of this section has been reserved for the presentation of diurnal effects on mood; these latter data were based on the above school-period distribution.

B. Edmonton-Sample Results

Using an analysis of variance repeated-measures program, statistical data were collected for the effects of classroom-condition on the four pre-adolescent mood scales. Additionally, because previous research in both the adult and child domains report state differences associated with gender and age (see Howarth & Schokman-Gates, 1981; and Schokman-Gates, 1981, for reviews of this area), separate analyses were undertaken using these subject variables. Tables 6.2 through 6.8 present these data.

Main and Interaction-Effects on Mood Scales

Classroom Condition

As can be seen from the first two tables, highly significant results were obtained for all of the PAMS subscales. The exam condition (Table 6.2) produced significant reductions in the **Surgency** ($p<.001$) and **Mastery/Self-Esteem** dimensions ($p<.004$), while a significant increase was noted for the **Aggression** factor ($p<.002$). The main-effects analysis was not significant for the **Sadness** subscale, although the data were seen to be in the expected direction. Looking at interaction-effects (Table 6.3), however, one finds that this dimension did reach significance when grade was taken into account: The exam condition produced elevated **Sadness** scores (p<.002) for the youngest and oldest students, while children in the intermediate-grades changed very little. Likewise, the effect of an impending exam on the feelings of Surgency and **Mastery/Self-Esteem** appeared to be most evident in Grades 3 and 6, with reductions in these moods found to be significant at the .021 and .001 levels, respectively.

Sex and Grade

Table 6.4 presents data revealing the presence of significant differences in mood levels based on gender and age factors. As was found in the analyses for classroom-condition, significant main-effects appeared for the three subscales of **Surgency**, **Aggression**, and **Mastery/Self-Esteem**. Females and grade 3 students scored considerably **higher** in **Surgency** (p<.006 and .001, repectively)[1], and significantly **lower** in **Aggression** (p<.001 and .018, respectively) than did most of the other students; grade 4 children were also found to have scored lower on the **Aggression** subscale. On the other hand, the **Mastery/Self-Esteem** factor was found to have significantly elevated values for males and third grade pupils (p< .001 for both groups).

A perusal of the grade means provided some support for developmental trends in mood states, as both Surgency and Mastery/Self-Esteem were found to decline with increasing age, while Aggression was seen to be more prominent. Nonetheless, no significant interaction effects for grade-by-sex were present on any of these scales, although, as noted above, there were significant differences produced by the interaction of grade-by-condition (Table 6.3).

Main and Interaction-Effects on Mood Items

Classroom Conditions

A breakdown of the PAMS subscales indicated that the significant differences between the classroom conditions were mainly attributable to the following items: For **Surgency** (Table 6.5), the children appeared significantly more **cheerful** ($p<.001$), **glad** ($p<.003$), and **joyful** ($p<.001$) in the film condition, and felt more **wonderful** ($p<.001$) and **like smiling** ($p<.019$) at that time, than they did during the exam condition. Additionally, all grades showed changes in the expected direction for the items of **cheerful** ($p<.05$) and **wonderful** ($p<.002$), with grade six students revealing the greatest differences between the film and exam treatments.

Only one item of the Sadness scale was found to be significantly affected by the classroom-conditions. The feeling of being **lonely** (Table 6.5) appeared to be most prominent for third and fifth graders, who actually evinced an increase in this item during the film condition ($p<.003$). A breakdown of these two age groups by sex indicated that the males were responsible for this occurrence ($p<.017$), since their mean scores were found to climb between exam and film conditions, while those of their female cohorts either decreased or remained fairly stable.

The exam condition produced significant increases on only two Aggression descriptors (Table 6.6), those of being **bad-tempered** ($p<.027$) and **furious** ($p<.002$) Additionally, an age-by-condition interaction revealed significant and expected changes in the **bad-tempered** item for all grades except that of fourth, where an actual increase was found for the film treatment ($p<.027$).

The final set of mood items to be significantly affected by the classroom condition was that of **Mastery/Self-Esteem** (Table 6.6). Children in the exam treatment were found to possess diminished scores on feeling powerful ($p<.022$), strong ($p<.007$), and tough ($p<.05$), as well as perceiving themselves as being less handsome (or) pretty ($p<.001$). As with the bad-tempered item, fourth graders once more "bucked the tide" and evinced a decrease in powerful feelings during the film condition, whereas the other grades showed an increase ($p<.017$).

Sex and Grade

Table 6.7 presents data on the Surgency and Sadness items which were sensitive to gender and age effects. In line with the previous results obtained for the Surgency subscale, females and grade three children were found to score significantly higher on the first four mood descriptors than did their cohorts, while third graders also maintained this edge for the final Surgency item. Probability values for this subscale ranged from .05, for differences between genders on the feeling of glad, to .001, for almost all of the other analyses.

The Sadness dimension (Table 6.7) appeared to be affected most by age differences, since both feelings of being trapped and unwanted reached significance levels of $<.05$ across grades. Nonetheless, the pattern for these two descriptors differed, with the first item being more salient in grades 3 and 6, while the last one decreased in value as the ages increased.

All variables on the **Aggression** subscale (Table 6.8) revealed the presence of significant differences based on sex and/or age, with gender producing the greatest influence: Males felt consistently more **bad-tempered** ($p<.05$), **bossy** ($p<.022$), and **mean** ($p<.003$), and produced higher scores on the item **like hitting** ($p<.001$), than did the female students. On the other hand, the mood descriptor of **furious** was found to be more related to age ($p<.05$), with its salience being most notable in the middle two grades; this item did not appear to be as important to either the youngest or oldest children, since their low scores were almost identical. The most physically aggressive of the scale's items, that of **like hitting**, was also discovered to be age-related ($p<.03$); however, this time the division was found to be between the lower and upper grades, with the latter group possessing a higher Aggression-item score.

A perusal of the **Mastery/Self-Esteem** data (Table 6.8), revealed the influence of sex and age on three items, with a fourth mood descriptor being significant for gender alone. Males and grade 3 students were found to feel consistently more brave, powerful, and tough than their cohorts, with a steady decline in mean scores for these variables being noted as age increased. The mood item strong was significant at the .001 level for sex differences, possessing an elevated score in the male sample. All other differences were also found to be at the .001 level of probability, save that of grade-on-tough, which was significant at .039.

Diurnal Variation in Mood States: Condition, Sex & Grade

Because data on both the film and exam conditions were collected throughout the school day, it was possible to determine the combined effect of treatment and diurnal variation on the children's mood states. Additionally, gender and age influences were considered important, with separate diurnal variation analyses being undertaken for each of these variables in the two classroom conditions.

The mood fluctuations obtained for each subgroup over the course of the school day are shown in Figures 1-12. Data regarding the classroom-condition are presented for four time periods--two in the morning and two in the afternoon--while sex and grade differences are shown for only morning vs afternoon testing. This latter approach was chosen both for sake of clarity, and in order to allow for direct comparison between the Edmonton and Wetaskiwin populations; statistical analyses on the two morning and two afternoon data sets had indicated that it was appropriate to collapse them into single morning vs afternoon time periods. Presentation of these data will maintain the order of Surgency first, since it was the mood scale most affected by time-of-day variables, to be followed by those of Aggression, Mastery/Self-Esteem, and Sadness.

Surgency

As can be seen from the first two figures, the PAMS Surgency scale was greatly affected by the various conditions chosen for analysis: Taking the exam treatment first (Fig. 1), we find that the students began the day with a fair degree of Surgency which drastically declined until the end of the day; a sharp upswing was then again noted, albeit this increase did not reach the level attained during the early morning testing. The film group, on the other hand, began at a higher level of Surgency than did those in the exam, and continued to become more surgent throughout the morning. The afternoon data, however, revealed a steady decrease in such positive feelings, with day's end bringing the lowest value seen for the film condition. Here too, though, it was a higher score than the one produced by the exam treatment. Significance levels of less than .03 were found for the effects of time on both the film- and exam-Surgency scores.

Looking at the gender and grade analyses for this mood, we note significant diurnal effects for the female exam group (Fig. 2), who began the day with elevated feelings of Surgency, but ended it with a decrease that was so great it even fell below the male score (p<.005). The film condition appeared to have no great affect on the different sexes, since their data revealed a similar decline in Surgency from morning to afternoon.

Although there were no significant diurnal effects discovered for the grade analyses (Fig 3), several interesting findings did emerge: The exam condition saw an increase in the afternoon Surgency score for the youngest and oldest children, while the intermediate-aged children evinced a decline. On the other hand, children in the film treatment followed the expected direction, with all age groups, save that of grade 4, showing a decrease over the course of the day.

Aggression

As was found with the Surgency subscale, Aggression also revealed itself as being sensitive to time-of-day variables. For, even though a general trend of increased Aggression-over-time was obtained (Fig. 4), it is notable that the film condition produced much lower scores on this factor. Significant diurnal effects on these data reached levels of .01 and .005 for the exam and film treatments, respectively.

Likewise, the sex and grade analyses produced significant data regarding the increase of Aggression scores from morning to afternoon. Nonetheless, these significances related only to the film treatment, with females (Fig. 5), and grades 5 and 6 (Fig. 6), evincing a considerable elevation from their morning levels ($p<.03$,.01 and .03, respectively). Two things are of interest here: 1) For the gender analyses, the lowest Aggression scores attained by each sex in the exam condition either exceeded or equalled the highest scores attained in the film condition; and 2) for the age analyses, all of the exam treatment scores followed the common pattern of increased Aggression over time, while the film treatment scores revealed an actual decrease over time in grade 4.

Mastery/Self-Esteem

Diurnal analyses on the Mastery/Self-Esteem subscale revealed significant differences among scores on the exam condition, as well as for females and grade 5 students over-time. Figure 7 graphically depicts the sharp drop in such positive feelings when the children were faced with an exam right after lunch ($p<.01$); note that this time was, conversely, the most encouraging for the film group. The other three time periods are seen to have had approximately the same effect on both the exam and film conditions.

The significant effect of time on Mastery/Self-Esteem-for-gender (Fig. 8) was found to occur in the exam condition, where females evinced a sharp decline from morning to afternoon ($p<.05$); males showed a similar trend, albeit their decrease was not significant. The film data, on the other hand, showed a partial reversal of this pattern, with girls increasing their positive self-perceptions by the afternoon testing, while boys remained fairly stable.

Students in grade 5 were found to be the ones most responsible for the significance shown in the film condition (Fig. 9). For, even though the two younger age groups also evinced an increase over time for Mastery/Self-Esteem, only the fifth graders reached a probability level of <.05, while grade 6 students showed a slight decline in their over-time data. The exam condition-on-grades did not appear to be affected by time-of-day variables, although an interesting pattern was found to emerge: Grades 4 and 6 revealed parallel increases in their feelings of Mastery and Self-Esteem, while grades 3 and 5 showed similar decreases over the course of the day. None of these analyses, however, was significant.

Sadness

The PAMS Sadness subscale appeared to be the one least affected by condition, gender, or grade in interaction with diurnal variation, since almost all analyses revealed the same pattern of increased negative feelings over the course of a day. In line with my expectations, though, the exam condition (Fig. 10) produced the greatest effect, with the afternoon testing sessions having significantly higher scores than the morning ($p<.05$); a moderate increase in Sadness over the day was found for the film data.

The only gender- or age-effect to reach significance was that for girls in the exam condition (Fig. 11). For, although they started the day with approximately the same scores as the boys, the data revealed there to be a considerable increase in their sad feelings by the afternoon ($p<.05$); boys, on the other hand, had shown only a moderate elevation by that time. These female subjects also appear to have maintained the increased Sadness-over-time pattern during the film condition, while the males came into the after noon testing with an actual decrease in self-reported feelings of sadness.

No significant differences were found for diurnal Sadness scores when grades were used as the defining variable (Fig. 12). Nonetheless, there is one interesting comparison to be made: Grade 4 is seen to be the "deviant" group in both of the treatment conditions--it displays the greatest increase in afternoon -Sadness for the film condition. This also was the pattern displayed by grade 4 for the other "negative" mood scale, that of Aggression. Interestingly enough, the only age group which showed an increase in afternoon-film Surgency also happened to be comprised of fourth grade pupils. In fact, out of eight diurnal variation analyses, these grade 4 children were found to be deviant in seven of them. More attention will be devoted to this issue in the discussion chapter of this manuscript.

C. Wetaskiwin-Sample Methodology:

School Color/Light vs Control Condition

Subject Sample

Although 372 students were involved in the construct validation phase (please refer to Table 5.8 for this sample distribution), the empirical data analyses were based on the entire sample size of 378. Table 6.9 presents this new subject distribution based on sex, grade, and school. Additionally, information regarding the total number of classes in each school is also included. As can be seen from this table, 130 control-school (Centennial) students were used, while the experimental schools (Norwood, Parkdale, and McMurdo) contributed 248 subjects.

Procedure

Using a repeated-measures design, the Pre-Adolescent Mood Scale was self-administered by 378 third-sixth grade students. Testing was carried out twice on the same day (Monday, May 9th), and at the same times (9:05 A.M. and 2:30 P.M.) in order to control for possible weather, time-of-day and day-of-week affects. Analyses based on diurnal affects, as well as those relating to school environment, gender, and grade, will be presented in the empirical results to follow.

D. Wetaskiwin-Sample Results

Using an analysis of variance repeated-measures program, statistical data were collected for the affects of school environment on the four pre-adolescent mood scales. Moreover, in order to allow for comparisons between the mood data of the Wetaskiwin and Edmonton samples, separate analyses were also undertaken using gender and age variables. Tables 6.10 through 6.13 present these data.

Main and Interaction Effects on Mood Scales

Main-Effects for School

As can be seen from Tables 6.10 and 6.11, significant main-effects for school were obtained for the mood scales of Surgency, Aggression, and Mastery/Self-Esteem. Separate analyses on morning and afternoon data (Table 6.11) revealed that children at Norwood, Centennial, and Parkdale schools were significantly more surgent during the morning testing than were those who attended McMurdo ($p<.01$; $p<.023$)[2]; no differences between schools were noted for either the afternoon testing on this mood factor, or for the combined data analyses (Table 6.10). These combined analyses, however, did reveal significant differences for **Aggression**, with Norwood and Centennial showing an increase over Parkdale and McMurdo ($p<.05$; $p<.028$). This trend was also found when the morning data were analyzed separately ($p<.049$; $p<.01$), nevertheless, since there were no significant differences found for the afternoon data, the possibility exists that the individual school-conditions experienced over the day may have had an equalizing affect on the students' aggressive feelings.

The final main-effect of school was noted to be on the mood factor of **Mastery/Self-Esteem**. In fact, it was this scale which attained the greatest levels of significance, as well as the greatest number of differences among the schools: Centennial and McMurdo were consistently lower in **Mastery/Self-Esteem** for the combined analyses (Tables 6.10, $p<.002$; $p<.001$), as well as on those for the morning (Table 6.11, $p<.008$; $p<.013$) and afternoon (Table 6.11, $p<.019$; $p<.01$).

Interaction-Effects for School

Turning now to the interaction-effects for school (Tables 6.12 - 6.14), further analyses of the data indicated that the covariates of time and grade (age) played significant roles in the school-interaction. Table 6.12 presents these effects for the mood scale of Surgency, where both time-of-day and grade-of-child produced significant differences among the four Wetaskiwin schools: All of the experimental groups (Norwood, Parkdale, and McMurdo) experienced an increase in Surgency over the school day, while the control group (Centennial) showed the reverse pattern of decreased surgent feelings ($p < .001$). The data for school-by-grade (with morning and afternood combined) followed a similar trend ($p < .041$), with all experimental schools recording a greater degree of Surgency in grades 4 and 5, nontheless, the control group did reveal an increase over the other schools for grade 6. This unexpected finding may be explained by looking at the school-by-grade-by-time data (Table 6.12, $p < .01$), where Centennial grade 6 students were found to be higher than the experimental groups both in start-of-school day and end-of-school day Surgency. These grade 6 control students did not, however, show significant increases over the school day, as did the students in Norwood and McMurdo.

Table 6.13 presents data for the schools and their grade-by-time on the the mood scale of Sadness; a mood factor which has been found to be less affected by the school environment than it is by sudden and specific events in the environment. The data from this analysis indicate that the strongest school-effect on Sadness could be found in grade 5, where all of the experimental groups were significantly lower in afternoon feelings of Sadness, while the control school was significantly higher (p<.025).

As with the previous scales, the mood factor of Aggression was significantly affected by the schools' interactions with grade and time (Table 6.14, p<.001). A perusal of the data indicated that fifth graders in Norwood and Parkdale showed significant declines in their self-reported aggressive feelings over the school day, while Centennial fifth graders evinced a significant increase. This pattern, however, was reversed for grade 6, where all of the experimental schools showed elevations in the afternoon data, while the control school revealed a decline.

Multiple Comparisons for School-Effect

Turning now to the multiple comparisons for school-on-scales, one-way analyses of variance indicated that sex, as well as school, grade, and time, played significant roles in the mood scores obtained. Table C.1 presents data for the scale of **Surgency**. In addition to the main effects already noted for school-on-morning **Surgency** (Table 6.11), other main effects were found for school-on-**Surgency** when one-way anovas were run on each grade divided by gender: Grade 5 females revealed significant differences between McMurdo (lower scores) and the other three schools on morning **Surgency** ($p<.05$), while the afternoon data showed a significantly less surgent feeling being reported for Centennial, the control school, as compared to the experimental schools ($p<.004$). Moreover, analysis on grade 6 females found McMurdo and Norwood to be significantly lower than Parkdale on the morning data ($p<.026$), with McMurdo continuing this trend into the afternoon ($p<.028$).

Multiple t-tests on these data indicated that the experimental schools (either singly and/or in combination with each other) were significantly different

($p<.05$ or lower) from the control school for females in grade 3 (morning), grade 4 (afternoon), grade 5 (morning and afternoon), and grade 6 (morning). Males, on the other hand, were found to have significant differences present only for fifth graders in the afternoon, where all three experimental schools had increases in Surgency ($p<.038$) over that of Centennial.

For the mood factor of Sadness (Table C.2), multiple t-tests on the morning data revealed that fourth grade females in the three experimental schools had significantly lower scores than those in the control school ($p<.041$); moreover, afternoon testing with this group indicated that the Norwood girls were significantly less sad than were Centennial's ($p<.029$). Grade 5 females evinced the same pattern, with Norwood, Parkdale, and McMurdo being significantly lower in Sadness scores as compared to Centennial ($p<.037$); however, this analysis applied only to the afternoon data. As with the Surgency factor, grade 5 boys were the sole male group to be affected by the differences in schools, with Norwood being significantly higher in the morning Sadness score than was McMurdo ($p<.05$).

Table C.3 presents data for the scale of Aggression. In addition to the main effects already noted for school-on-morning **Aggression** (Table 6.11), multiple t-tests revealed significant elevations for this factor in Centennial and Norwood, as compared to Parkdale and McMurdo: Morning data on grades 3 - 6 and grades 4 - 6 were found to be significant at the <.05 level, while afternoon data were found to be at the .032 level for grades 3 - 6; grades 4 - 6 in the afternoon were only significantly different for McMurdo (lower) and Centennial (p<.05). One-way analyses of variance revealed significances on the afternoon **Aggression** scale for fourth and fifth grade females (p<.05 and p<.01, respectively), where Centennial was found to be much higher than the experimental schools. Fourth and fifth grade males, on the other hand, evinced their greatest differences on the morning data, with Centennial being significantly higher in **Aggression** for the fourth grade (p<.015), while Norwood was higher for the fifth grade (p<.005). Grade 6 females and males showed a reversal of their gender-patterns, with Norwood and Centennial girls being significantly higher on the morning scores (t-test, p<.033), while Norwood was significantly higher on the afternoon scores for boys (p<.028).

Multiple comparisons and t-tests for schools-on-**Aggression** indicated that the experimental groups had significantly lower **Aggression** scores than did the control group for females in grade 4 (afternoon, $p<.014$) and grade 5 (afternoon, $p<.001$), and for males in grade 4 (morning, $p<.005$). On the other hand, males in grades 5 (morning, $p<.037$) and 6 (afternoon, $p<.007$) had significantly higher **Aggression** scores for these schools than did the control.

The last mood scale of interest is that of **Mastery/Self-Esteem**. In addition to the main effects already noted for school-on-morning and afternoon self-esteem (Table 6.11), multiple analyses of this factor revealed fairly consistent significant differences between Norwood and Centennial across all grades and times for the female students (Table C.4): Norwood girls were always higher in feelings of **Mastery/Self-Esteem** than were those girls attending Centennial, with t-test results ranging from probability levels of .048 down to .002. These multiple significance tests further revealed that the two experimental schools of Parkdale and Norwood were consistently higher in such feelings, as compared to Centennial and McMurdo. In fact, even though there were significances found between the control group and

Parkdale and Norwood, the greatest levels of difference were for these two experimental schools verus McMurdo; Centennial was actually more similar to Parkdale than it was to McMurdo on three of the four school-analyses, with the latter school always evincing the lowest scores on **Mastery/Self-Esteem**.

Main and Interaction-Effects for Sex and Grade

Tables 6.15 and 6.16 present data revealing the presence of significant differences in mood levels based on gender and age factors. As was found in the analyses for school-effect, **Surgency** and **Aggression** are again seen to be the two mood factors of most concern, with females having significantly higher levels of **Surgency** but lower levels of **Aggression**. The **Mastery/Self-Esteem** dimension was also affected by this sex variable, as evidenced in Table 6.15, where males are found to have scores approximately 50% higher than those reported by the females.

The significant differences found for mood states between grades (Table 6.16) appear to be strongly related to diurnal factors, since the younger students showed decreases in **Surgency** scores over the course of the day, while the older students revealed increases. The **Aggression** data presented no such trend as all age groups were found to increase their hostile feelings over time; third graders, however, did start their day with the lowest level of **Aggression**, and ended it with the highest.

Main and Interaction Effects on Mood Items

Schools on Surgency

A breakdown of the four mood scales into their component parts indicated that the significances among the experimental and control schools were mainly attributable to the following items: For **Surgency** (Table 6.17), students from the experimental group appeared significantly more **cheerful** and **glad** (p<.001) in the afternoon, and felt more **like smiling** (p<.033) at that time did those in the control group. Moreover, females in grades 4 and 5 felt more **joyful** (p<.004) in the afternoon at the experimental schools, as oppossed to those in the control; fourth and fifth grades at this school were also significantly less **glad** (p<.042) in general. Lastly, increases over the day for the feeling of **wonderful** were found to be significant (p<.006) only for the experimental group.

Schools on Sadness

For **Sadness** (Table 6.18), the two items found to be significantly different among the schools were **sad** and upset, with the fourth and fifth grades at Norwood and Parkdale showing reductions in their sad mood over the day, while the control school, Centennial, evinced an increase (p<.025). Centennials's fourth, fifth, and sixth graders also revealed a significant elevation for their afternoon scores on being upset, whereas the scores at Norwood significantly declined (p<.04).

Schools on Aggression

The Aggression factor (Table 6.19) revealed differences on all five of its items, with Norwood and Centennial having the greatest impact on this mood dimension: These two schools were significantly higher than Parkdale and McMurdo on overall feelings of being bad-tempered (p<.025), bossy (p<.01), and mean (p<.036), as well as feeling more like hitting (p<.016). Grade and time-of-school day did, however, play a significant role in altering these aggressive feelings, since Norwood and Parkdale fifth graders consistently showed declines in all of the afternoon Aggression items (p<.032) while Centennial fifth graders increased on such measures; all other age groups were inconsistent in their elevations and reductions on these mood components. Likewise, school-by-sex differences only revealed themselves on one item, that of feeling **mean**, with females at Norwood showing a significant decline (p<.006), while all other groups increased over the span of one day.

Schools on Mastery/Self-Esteem

As with the **Aggression** factor, all five items of the **Mastery/Self-Esteem** dimension revealed significant differences among the schools (Tables 6.20). This time, however, the differences were most notable for Norwood and Parkdale in contrast with Centennial and McMurdo. The students at these two experimental schools felt significantly more **brave** (p<.007), **handsome (or) pretty** (p<.001), and **strong** (p<.029) in general than did those children at the control school and McMurdo. Furthermore, feelings of being **powerful** (p<.047) were greater for females at Norwood than at the other schools, while the mood item **tough** revealed its strongest differences to be between Norwood and McMurdo (p<.044). In fact, on all items except **handsome (or) pretty**, McMurdo had the lowest level of **Mastery/Self-Esteem**, followed by Centennial, Parkdale, and finally Norwood, which maintained the highest degree of positive self-feelings. This **handsome/pretty** component, on the other hand, showed a shift in the relative school ordering, with Centennial students feeling less confident about their attractiveness than did those in all three of the experimental schools.

Sex and Grade on Surgency

Analyses based on gender and age factors indicated that the first four Surgency items were significant discriminators for sex, while three of them were also significant for grade; Table 6.21 presents these data. As was found in the Edmonton sample, females comprised the one group which possessed elevated scores on **cheerful** ($p<.001$), **glad** ($p<.002$), **joyful** ($p<.021$) and **like smiling** ($p<.001$). The latter three items were also the ones most affected by age differences, with younger students being more **glad** in general ($p<.002$), but showing decreases over time for the feelings of **joyful** ($p<.002$) and **like smiling** ($p<.002$); the other students followed the reverse pattern on these two variables.

Sex and Grade on Sadness

For the subscale of **Sadness** (Table 6.22), the only items found to be significantly different for sex and grades were those of **lonely** and **sad**. All age groups revealed reductions in their **lonely** feelings over the course of a day, save that of grade 4 ($p<.05$), while the **sad** feelings were affected by both gender and age. This mood item was found to be most relevant for fourth grade girls, who obtained the highest scores on it, and least applicable to fourth and sixth grade boys ($p<.046$). Contrary to expectations, though, fifth grade males were also seen to have elevated levels on this variable.

Sex and Grade on Aggression

The **Aggression** subscale (Table 6.23) revealed differences on all five of its items, with gender having the greatest impact on this mood dimension: Boys, of any age, were significantly higher on their overall feelings of being **bad-tempered** ($p<.002$), **bossy** ($p<.001$), **furious** ($p<.04$), and **mean** ($p<.001$), as well as also feeling more **like hitting** ($p<.001$). Moreover, significantly elevated levels for these first four items were also found at the end of the day for males, while females evinced no such diurnal variations for this mood.

Regarding age effects on this state dimension, grade 4 girls appeared to be the most aggressive of their sex, revealing increased levels of being **bossy** and feeling **like hitting**, whereas grade 5 boys maintained this position in the male sample. The mood item **furious** was the only one found to have a main-effect for grade, with significant declines in value occuring over all four of the age groups ($p<.013$); no other **Aggression** variable showed such a trend.

Sex and Grade on Mastery/Self-Esteem

As with the previous mood scale, all five items of the **Mastery/Self-Esteem** dimension revealed the presence of significant differences between sexes (Table 6.24), with females being consistently lower; this time, however, no diurnal interactions were apparent for any of the analyses. Grade, on the other hand, produced main effects for two items: Scores on **brave** were found to decrease as age increased, while those on **handsome (or) pretty** were found to be the most elevated in grade 5. Significance levels for all of these measures were in the .02 to .001 range of probability.

Diurnal Variation in Mood States:

School, Sex, and Grade

As has been consistently found in the previous data analyses, **Surgency** was once more the primary mood scale affected by time-of-school day variables. This applied for all sample distributions, whether the composition was based upon gender, age (grade), or school condition. Similarly, the **Aggression** and **Mastery/Self-Esteem** subscales were found to be influenced by diurnal variation irrespective of the population base used. This, however, was not the case for the remaining state dimension of **Sadness**, where scale deviance only reached significant levels in the gender sample.

Surgency

The mood fluctuations for each group over the course of the school day, are graphically depicted in Figures 13 - 20. As can be seen from the first set (Figs. 13 & 14), the mood scale of **Surgency** was greatly affected by the distribution base chosen for analysis: Taking school-condition as the deciding factor (Fig. 13), we find the three experimental schools started the day with significantly lower feelings of **Surgency** which increased with the passage of time; the control school showed the reverse pattern.

The gender-analysis (Fig. 14), on the other hand, revealed differences between the sexes for afternoon data only, since both groups began at approximately the same level of morning **Surgency**, but finished with the males evincing a significant increase in their afternoon mood state. Age differences for this dimension were seen to be most pronounced between those children in grades 3 and 5 (Fig. 14); for, even though third graders started the day as the most surgent group, they ended it as the least, while grade 5 students were found to follow the opposite pattern. Moreover, it is of interest to note that the two younger grades revealed a course of diurnal variation which was the reversal of that shown by the older grades; this interaction was found to be significant at the .005 level.

Aggression

The **Aggression** subscale revealed itself to be most sensitive to differences between the sexes (Fig. 16) at the afternoon testing ($p<.001$), although all analyses were significant save that of afternoon **Aggression** between schools (Fig. 15). As expected, males maintained significantly higher levels of hostile responses on the PAMS for both the morning and afternoon, while all schools (Fig. 15) and age groups (Fig. 16) showed an increase in such feelings as the day wore-on.

Mastery/Self-Esteem

As was found with the **Surgency** and **Aggression** factors, diurnal analyses for **Mastery/Self-Esteem** revealed significant increases for the majority of groups over-time: Norwood maintained the highest levels of self-esteem throughout the day, followed by Parkdale, Centennial, and McMurdo (Fig. 17). Likewise, males and females and grades 4, 5, and 6 (Fig. 18) were found to increase in their feelings of **Mastery/Self-Esteem** from morning to afternoon. The only subjects who did not follow such a pattern were those students in grade 3, where a decrease in their afternoon mood state was reported.

Sadness

The PAMS **Sadness** dimension (Figs. 19 & 20) appeared to be the one least affected by the interaction of school, sex, or grade with diurnal variation, since almost all analyses revealed the same pattern of decreased negative feelings over the course of a day.[3] The one exception was that of grades-on-time (Fig. 20), where 4th graders were found to actually have an increase in scores for that dimension when measured at mid-afternoon. Nevertheless, significant differences were found only for a general decrease of Sadness scores ($p<.05$) between morning and afternoon testings.

Notes for Chapter VI

1. Similar findings in regard to the **Surgency** and **Aggression** subscales may be found in the Wetaskiwin analyses; both of these data sets closely parallel the results obtained in my M.Sc. research (Schokman-Gates, 1981).

2. Separate analyses were run for grades 3 - 6 and grades 4 - 6, since McMurdo had no third graders included in this mood study.

3. This is in sharp contrast to what was found in the Edmonton data (presented in a previous section of this chapter), where **Sadness** scores tended to increase from morning to afternoon.

TABLES FOR CHAPTER VI

Table 6.1

Subject Distribution for Criterion-Related Validation Edmonton Sample

Condition	Grade				Total N
	3	4	5	6	
Exam N	131	105	153	115	504
female n	55	53	83	56	247
male n	76	52	70	59	257
Film N	106	114	126	128	474
female n	44	58	69	57	228
male n	62	56	57	71	246

Table 6.2

Edmonton: Main Effects[a] for Exam & Film
on Mood Scales

PAMS Subscale	Mean[b] (n=474) EXAM	FILM	F Probability
Surgency	9.188	10.148	.001
Sadness	2.789	2.527	.174
Aggression	2.580	2.063	.002
Mastery/ Self-Esteem	7.511	7.918	.004

---

[a] Data presented are from analyses of variance on repeated measures; only those students who were present for both administrations were included in these analyses.

[b] Scale means have a possible range from 0 (no mood items were applicable to the children at that time) to 15 (all mood items had the highest degree of applicability to the children at that time).

Table 6.3

Edmonton: Interaction-Effects[a] for Exam & Film on Mood Scales

PAMS Subscale	Interaction	N	Mean[b] Exam	Mean[b] Film	F Probability
Surgency	Grade by condition	474			.021
	Grade 3	106	10.472	11.689	
	4	114	9.702	9.930	
	5	126	9.071	9.579	
	6	128	7.781	9.625	
Sadness	Grade by condition				.002
	Grade 3	106	3.000	2.594	
	4	114	2.693	2.553	
	5	126	2.476	2.508	
	6	128	3.344	2.133	
Mastery/ Self-Esteem	Grade by condition				.001
	Grade 3	106	8.557	9.708	
	4	114	7.965	7.728	
	5	126	7.143	7.071	
	6	128	6.602	7.438	

---

[a] Data presented are from analyses of variance on repeated measures; only those students who were present for both administrations were included in these analyses.

[b] Scale means have a possible range from 0 (no mood items were applicable to the children at that time) to 15 (all mood items had the highest degree of applicability to the children at that time).

Table 6.4

Edmonton: Anovar[a] for Sex & Grade on Mood Scales

PAMS Subscale	Main Effect	N	Mean[b]	F Probability
Surgency		474		
	Sex			.006
	Female	228	10.129	
	Male	246	9.240	
	Grade			.001
	3rd	106	11.080	
	4th	114	9.816	
	5th	126	9.325	
	6th	128	8.703	
Aggression				
	Sex			.001
	Female	228	1.899	
	Male	248	2.713	
	Grade			.018
	3rd	106	1.868	
	4th	114	2.057	
	5th	126	2.690	
	6th	128	2.570	
Mastery/ Self-Esteem	Sex			.001
	Female	228	6.500	
	Male	248	8.839	
	Grade			.001
	3rd	106	9.132	
	4th	114	7.846	
	5th	126	7.107	
	6th	128	7.020	

---

[a] Anovar = Analysis of Variance on Repeated Measures

[b] Scale means have a possible range from 0 to 15

[c] Only F Probabilities of $\leq$.05 are presented

Table 6.5

Edmonton: Anovar[a] for Exam & Film on Surgency & Sadness Items

Surgency Mood Item	Mean[b] Exam	Mean[b] Film	F[c] Prob	Sadness Mood Item	Mean Exam	Mean Film	F Prob
1. Cheerful	1.975	2.181	.001	1. Lonely			
condition by grade			.050	condition by grade			.003
3	2.255	2.443		3	.500	.792	
4	2.095	2.116		4	.747	.558	
5	1.960	2.111		5	.516	.603	
6	1.615	2.064		6	.761	.495	
				condition by grade by sex			.017
2. Glad	1.959	2.126	.003				
				Female			
				Gr 3	.614	.636	
3. Joyful	1.803	2.034	.001	Gr 4	.796	.592	
				Gr 5	.609	.551	
				Gr 6	.615	.596	
4. Like Smiling	1.658	1.796	.019				
				Male			
				Gr 3	.419	.903	
5. Wonderful	1.739	1.986	.001	Gr 4	.696	.522	
				Gr 5	.404	.667	
condition by grade			.002	Gr 6	.895	.404	
3	1.925	2.302					
4	1.800	1.826					
5	1.810	1.921					
6	1.422	1.982					

[a] Anovar = analysis of variance for repeated measures

[b] 0 = "Not at all" response, 1 = "A little" response, 2 = "Somewhat response, 3 = "A lot" response to "Right now I feel..."

[c] Only F probabilities of $\leq .05$ are presented

Table 6.6

Edmonton: Anovar[a] for Exam & Film on Aggression & Mastery/Self-Esteem Items

Aggression	Mean[b]		F[c]	**Mastery/Self-Esteem**	**Mean**		F
Mood Item	Exam	**Film**	Prob	**Mood Item**	**Exam**	**Film**	Prob
1. Bad-tempered	.459	.342	.027	2. Handsome/ pretty	1.452	1.603	.001
condition by grade			.027				
				3. Powerful	1.349	1.466	.022
3	.396	.217					
4	.337	.442		condition by grade			.017
5	.508	.421					
6	.569	.284					
				3	1.698	1.934	
				4	1.505	1.379	
3. Furious	.523	.356	.002	5	1.198	1.254	
				6	1.046	1.330	
				condition by grade by sex			.036
				Female			
				Gr 3	1.136	1.636	
				Gr 4	1.184	1.000	
				Gr 5	.826	.884	
				Gr 6	.942	1.019	
				Male			
				Gr 3	2.097	2.145	
				Gr 4	1.848	1.783	
				Gr 5	1.649	1.702	
				Gr 6	1.140	1.614	
				4. Strong	1.628	1.764	.007
				5. Tough	1.333	1.438	.050

[a] Anovar = analysis of variance for repeated measures

[b] 0 = "Not at all" response, 1 = "A little" response, 2 = "Somewhat response, 3 = "A lot" response to "Right now I feel..."

[c] Only F probabilities of ≤ .05 are presented

Table 6.7

Edmonton: Anovar[a] for Sex & Grade on Surgency & Sadness Items

Surgency Mood Item	Mean[b] Sex	Mean[b] Grade	F[c] Prob
1. Cheerful			
female	2.154		.045
male	2.005		
Grade 3		2.349	.001
Grade 4		2.105	
Grade 5		2.036	
Grade 6		1.839	
2. Glad			
female	2.110		.050
male	1.977		
Grade 3		2.316	.001
Grade 4		2.079	
Grade 5		1.964	
Grade 6		1.835	
3. Joyful			
Grade 3		2.236	.001
Grade 4		1.921	
Grade 5		1.857	
Grade 6		1.679	
4. Like Smiling			
female	1.862		.001
male	1.597		
Grade 3		2.066	.001
Grade 4		1.689	
Grade 5		1.623	
Grade 6		1.550	
5. Wonderful			
Grade 3		2.113	.004
Grade 4		1.763	
Grade 5		1.865	
Grade 6		1.702	

Sadness Mood Item	Mean Sex	Mean Grade	F Prob
3. Trapped			
Grade 3		.571	.048
Grade 4		.400	
Grade 5		.369	
Grade 6		.619	
4. Unwanted			
Grade 3		.670	.050
Grade 4		.558	
Grade 5		.508	
Grade 6		.399	

---

[a] Anovar = analysis of variance for repeated measures

[b] 0 = "Not at all" response, 1 = "A little" response, 2 = "Somewhat" response, 3 = "A lot" response to "Right now I feel..."

[c] Only F probabilities of ≤.05 are presented

Table 6.8

Edmonton: Anovar[a] for Sex & Grade on Aggression & Mastery/Self-Esteem Items

Aggression Mood Item	Mean[b] Sex	Mean[b] Grade	F[c] Prob
1. Bad-tempered			
female	.353		.050
male	.446		
2. Bossy			
female	.269		.022
male	.401		
3. Furious			
Grade 3		.373	.050
Grade 4		.463	
Grade 5		.556	
Grade 6		.349	
4. Like Hitting			
female	.526		.001
male	.804		
Grade 3		.533	.030
Grade 4		.574	
Grade 5		.790	
Grade 6		.739	
5. Mean			
female	.360		.003
male	.570		

Mastery/Self-Esteem Mood Item	Mean Sex	Mean Grade	F Prob
1. Brave			
female	1.465		.001
male	1.818		
Grade 3		1.981	.001
Grade 4		1.679	
Grade 5		1.512	
Grade 6		1.440	
3. Powerful			
female	1.049		.001
male	1.752		
Grade 3		1.816	.001
Grade 4		1.442	
Grade 5		1.226	
Grade 6		1.188	
4. Strong			
female	1.350		.001
male	2.029		
5. Tough			
female	1.061		.001
male	1.698		
Grade 3	1.670		.039
Grade 4	1.368		
Grade 5	1.274		
Grade 6	1.252		

[a] Anovar = analysis of variance for repeated measures

[b] 0 = "Not at all" response, 1 = "A little" response, 2 = "Somewhat" response, 3 = "A lot response to "Right now I feel..."

[c] Only F probabilities of ≤.05 are presented

Table 6.9

Subject Distribution for Criterion-Related Validation Wetaskiwin Sample

School	Grade 3	Grade 4	Grade 5	Grade 6	Total N
Norwood N (color & light)	21 (one class)	22 (one class)	16 (one class)	16 (one class)	75 (four classes)
female n	7	10	7	11	35
male n	14	12	9	5	40
Centennial N (control)	23 (one class)	40 (two classes)	26 (one class)	41 (two classes)	130 (six classes)
female n	11	19	11	21	62
male n	12	21	15	20	68
Parkdale N (light only)	13 (one class)	27 (one class)	36 (two classes)	40 (two classes)	116 (six classes)
female n	6	14	17	19	56
male n	7	13	19	21	60
McMurdo N (color only)	no grade 3 students	18 (one class)	20 (one class)	19 (one class)	57 (three classes)
female n		12	12	7	31
male n		6	8	12	26
Total N	57 (three classes)	107 (five classes)	98 (five classes)	116 (six classes)	378

Table 6.10

Wetaskiwin: Main-Effects for School on Mood Scales[a]

(Morning & Afternoon Combined)

SCALE	SCHOOL[b]	N	MEAN[c]	PROBABILITY
Aggression	Grades 3 - 6	365		.050
	Norwood	75	3.080	
	Centennial	124	2.887	
	Parkdale	110	2.264	
	McMurdo (no grade 3)	56	2.000	
	Grades 4 - 6	310		.028
	Norwood	54	3.139	
	Centennial	103	2.966	
	Parkdale	97	2.206	
	McMurdo	56	2.000	
Mastery/ Self-Esteem	Grades 3 - 6	365		.002
	Norwood	75	9.093	
	Centennial	124	7.738	
	Parkdale	110	8.218	
	McMurdo (no grade 3)	56	6.866	
	Grades 4 - 6	310		.001
	Norwood	54	9.343	
	Centennial	103	7.733	
	Parkdale	97	7.954	
	McMurdo	56	6.866	

[a] Only F probabilities of $\leq .05$ are presented

[b] School: Norwood = Light & color change, Centennial = Control, Parkdale = Light change only, McMurdo = Color change only

[c] Scale means have a possible range from 0 (no mood items were applicable to the children at that time) to 15 (all mood items had the highest degree of applicability to the children at that time)

Table 6.11

Wetaskiwin: Main-Effects for School on Mood Scales

(Morning vs Afternoon Testing)

SCALE	TIME	SCHOOL	N	MEAN	F PROBABILITY
Surgency	Morning	Grades 3-6	370		.01
		Norwood	75	9.493	
		Centennial	126	9.984	
		Parkdale	113	9.956	
		McMurdo	56	7.946	
		(no grade 3)			
Aggression	Morning	Norwood	75	2.840	.049
		Centennial	126	2.516	
		Parkdale	113	1.876	
		McMurdo	56	1.911	
		(no grade 3)			
Mastery/ Self-Esteem	Morning	Norwood	75	8.600	.008
		Centennial	126	7.397	
		Parkdale	113	7.841	
		McMurdo	56	6.214	
		(no grade 3)			
	Afternoon	Grades 3-6	372		.019
		Norwood	75	9.587	
		Centennial	127	8.008	
		Parkdale	113	8.664	
		McMurdo	57	8.436	
		(no grade 3)			
Surgency	Morning	Grades 4-6	314		.023
		Norwood	54	9.111	
		Centennial	104	9.865	
		Parkdale	100	9.770	
		McMurdo	56	7.946	
Aggression	Morning	Norwood	54	3.204	.01
		Centennial	104	2.692	
		Parkdale	100	1.880	
		McMurdo	56	1.911	
Mastery/ Self-Esteem	Morning	Norwood	54	8.685	.013
		Centennial	104	7.308	
		Parkdale	100	7.560	
		McMurdo	56	6.214	
	Afternoon	Grades 4-6	316		.01
		Norwood	54	10.000	
		Centennial	105	8.124	
		Parkdale	100	8.440	
		McMurdo	57	7.421	

Table 6.12

Wetaskiwin: Interaction-Effects for School on the Mood of Surgency

Interaction	School	N	Mean		F Probability
School-by-time					
	Grades 3 - 6	365	Morning	Afternoon	.001
	Norwood	75	9.493	9.907	
	Centennial	124	10.032	9.556	
	Parkdale	110	9.964	10.136	
	McMurdo (no grade 3)	56	7.946	10.679	
	Grades 4 - 6	310			.001
	Norwood	54	9.111	10.333	
	Centennial	103	9.961	9.495	
	Parkdale	97	9.773	10.144	
	McMurdo	56	7.946	10.679	
School-by-grade					.041
	Grade 3	56			
	Norwood	21	9.643		
	Centennial	22	10.318		
	Parkdale	13	10.731		
	(No McMurdo)				
	Grade 4	105			
	Norwood	22	10.568		
	Centennial	38	9.276		
	Parkdale	27	10.370		
	McMurdo	18	10.944		
	Grade 5	97			
	Norwood	16	9.719		
	Centennial	26	8.673		
	Parkdale	35	10.171		
	McMurdo	20	9.225		
	Grade 6	108			
	Norwood	16	8.563		
	Centennial	39	10.872		
	Parkdale	35	9.429		
	McMurdo	18	7.778		

School-by-grade-by-time					
	Grade 3	56	Morning	Afternoon	.01
	Norwood	21	10.476	8.810	
	Centennial	22	10.546	10.091	
	Parkdale	13	11.385	10.077	
	(No McMurdo)				
	Grade 4	105			
	Norwood	22	10.773	10.364	
	Centennial	38	9.500	9.053	
	Parkdale	27	10.741	10.000	
	McMurdo	18	10.500	11.389	
	Grade 5	97			
	Norwood	16	8.250	11.188	
	Centennial	26	9.885	7.462	
	Parkdale	35	9.286	11.057	
	McMurdo	20	6.750	11.700	
	Grade 6	108			
	Norwood	16	7.688	9.438	
	Centennial	39	10.462	11.282	
	Parkdale	35	9.514	9.343	
	McMurdo	18	6.722	8.833	

Table 6.13

Wetaskiwin: Interaction-Effects for School on the Mood of Sadness

Interaction	School	N	Mean Morning	 Afternoon	F Probability
School-by-grade-by Time					
	Grade 3	56			.025
	Norwood	21	3.667	3.429	
	Centennial	22	3.091	2.273	
	Parkdale	13	2.615	3.769	
	(No McMurdo)				
	Grade 4	105			
	Norwood	22	2.500	2.136	
	Centennial	38	3.974	3.816	
	Parkdale	27	3.000	3.111	
	McMurdo	18	2.111	3.444	
	Grade 5	97			
	Norwood	16	5.188	3.000	
	Centennial	26	2.769	4.346	
	Parkdale	35	3.943	2.086	
	McMurdo	20	2.750	2.200	
	Grade 6	108			
	Norwood	16	3.313	2.750	
	Centennial	39	2.538	1.769	
	Parkdale	35	2.857	2.571	
	McMurdo	18	2.722	2.000	

Table 6.14

Wetaskiwin: Interaction-Effects for School on the Mood of Aggression

Interaction	School	N	Mean		F Probability
			Morning	Afternoon	
School-by-Grade-by Time					.001
	Grade 3	56			
	Norwood	21	1.905	3.952	
	Centennial	22	1.682	3.136	
	Parkdale	13	1.846	3.539	
	(No McMurdo)				
	Grade 4	105			
	Norwood	22	2.409	2.909	
	Centennial	38	2.605	4.000	
	Parkdale	27	1.556	2.630	
	McMurdo	18	1.611	1.167	
	Grade 5	97			
	Norwood	16	4.938	2.625	
	Centennial	26	1.769	4.654	
	Parkdale	35	2.543	1.771	
	McMurdo	20	2.100	2.250	
	Grade 6	108			
	Norwood	16	2.563	3.750	
	Centennial	39	2.256	1.718	
	Parkdale	35	1.543	3.143	
	McMurdo	18	2.000	2.833	

Table 6.15

Wetaskiwin: Anovar for Sex on Mood Scales

PAMS Subscale	Sex	N	MORNING	Mean	AFTERNOON	F Probability
Surgency						
	Grades 3-6	372				.001
	Females	181		10.415		
	Males	191		9.185		
	Grades 4-6	316				.001
	Females	158		10.360		
	Males	158		9.096		
Sex by time						
	Grades 3-6	370				.025
	Females	179	9.955		10.875	
	Males	191	9.233		9.138	
Aggression						
	Grades 3-6	372				.001
	Females	181		1.943		
	Males	191		3.217		
	Grades 4-6	316				.001
	Females	158		1.990		
	Males	158		3.170		
Sex by time						
	Grades 3-6	370				.011
	Females	179	1.847		2.040	
	Males	191	2.709		3.725	
	Grades 4-6	314				.021
	Females	156	1.929		2.052	
	Males	158	2.814		3.526	
Mastery/ Self-Esteem						
	Grades 3-6	372				.001
	Females	181		6.543		
	Males	191		9.418		
	Grades 4-6	316				.001
	Females	158		6.545		
	Males	158		9.288		

Table 6.16

Wetaskiwin: Anovar[a] for Grade on Mood Scales

PAMS Subscale	Grade	N	Mean[b] Morning	Afternoon	F Probability[c]
Surgency					
Grade by time					
	Grades 3-6	370			.003
	3rd	56	10.655	9.509	
	4th	105	10.257	9.971	
	5th	98	8.753	10.247	
	6th	111	9.120	9.972	
	Grades 4-6[d]	314			.014
	4th	105	10.257	9.971	
	5th	98	8.753	10.247	
	6th	111	9.120	9.972	
Aggression					
Grade by time					
	Grades 3-6	370			.05
	3rd	56	1.836	3.583	
	4th	105	2.486	2.933	
	5th	98	2.639	2.784	
	6th	111	2.028	2.667	

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[a] Anovar = Analysis of Variance on Repeated Measures

[b] Scale means have a possible range from 0 to 15

[c] Only F Probabilities of ≤.05 are presented

[d] One of the four schools involved had no grade 3, therefore two analyses were run for the 3rd-6th grades and 4th-6th grades

Table 6.17

Wetaskiwin: Anovar[a] for School on Surgency Items

SCHOOL ON ITEM	MEAN[b] MORN	MEAN[b] AFTN	F[c] PROBABILITY
1. Cheerful			
School by time			
Grades 3-6	2.038	2.071	.001
Norwood	2.04	2.07	
Centennial	2.14	2.00	
Parkdale	2.10	2.07	
McMurdo (no grade 3)	1.70	2.23	
Grades 4-6[d]	2.000	2.077	.001
Norwood	1.93	2.15	
Centennial	2.17	1.96	
Parkdale	2.04	2.07	
McMurdo	1.70	2.23	
School by grade by time			.004
Norwood 3rd	2.33	1.86	
4th	2.05	2.09	
5th	1.94	2.31	
6th	1.75	2.09	
Centennial 3rd	2.00	2.19	
4th	2.05	1.87	
5th	2.23	1.54	
6th	2.23	2.33	
Parkdale 3rd	2.54	2.08	
4th	2.19	1.89	
5th	1.86	2.31	
6th	2.11	1.97	
McMurdo 4th	2.06	2.44	
5th	1.50	2.55	
6th	1.56	1.67	
2. Glad			
School by time			
Grades 3-6	2.033	2.003	.001
Norwood	2.07	1.97	
Centennial	2.19	1.91	
Parkdale	2.04	2.07	
McMurdo (no grade 3)	1.63	2.11	
Grades 4-6	2.013	2.003	.009
Norwood	2.07	2.02	
Centennial	2.17	1.88	
Parkdale	2.03	2.06	
McMurdo	1.63	2.11	
2. Glad			
School by grade			.042
Norwood 3rd	1.952		
4th	2.273		
5th	2.000		
6th	1.781		
Centennial 3rd	2.167		
4th	1.987		
5th	1.808		
6th	2.218		
Parkdale 3rd	2.115		
4th	2.259		
5th	2.057		
6th	1.871		
McMurdo 4th	2.389		
5th	1.775		
6th	1.444		
3. Joyful			
School by time			
Grades 3-6	1.915	1.973	.01
Norwood	1.89	1.92	
Centennial	2.02	1.93	
Parkdale	1.99	2.02	
McMurdo (no grade 3)	1.55	2.05	

School by grade by time by sex	Males		Females	
			.004	
Norwood 3rd	2.21	1.57	2.14	1.86
4th	2.17	1.67	2.30	2.30
5th	1.44	1.78	1.43	2.86
6th	1.40	1.60	1.55	2.00
Centennial 3rd	2.25	1.75	2.00	2.11
4th	1.90	1.90	2.05	1.74
5th	1.67	1.33	2.00	1.64
6th	2.05	2.05	2.26	2.68
Parkdale 3rd	2.14	1.43	2.00	2.50
4th	2.31	1.92	2.00	2.14
5th	1.94	2.11	1.71	2.12
6th	1.79	1.68	2.25	2.25
McMurdo 4th	1.50	1.33	2.33	2.42
5th	1.88	1.88	1.00	2.67
6th	1.17	2.17	1.50	.83

4. Like Smiling			
School by time			
Grades 3-6	1.805	1.940	.033
Norwood	1.80	2.01	
Centennial	1.82	1.80	
Parkdale	1.95	2.00	
McMurdo (no grade 3)	1.50	2.04	
School by grade by time			.005
Norwood 3rd	1.95	1.71	
4th	2.00	2.14	
5th	1.63	2.19	
6th	1.50	2.06	
Centennial 3rd	2.00	1.71	
4th	1.74	1.68	
5th	1.89	1.27	
6th	1.77	2.31	
Parkdale 3rd	2.31	1.77	
4th	2.11	1.89	
5th	1.91	2.40	
6th	1.71	1.77	
McMurdo 4th	2.17	2.17	
5th	1.15	2.20	
6th	1.22	1.72	

5. Wonderful			
School by time			
Grades 3-6	1.789	1.989	.006
Norwood	1.69	1.93	
Centennial	1.86	1.92	
Parkdale	1.89	1.97	
McMurdo	1.57	2.25	
Grades 4-6	1.785	1.958	.012
Norwood	1.59	2.02	
Centennial	1.84	1.90	
Parkdale	1.83	1.95	
McMurdo	1.57	2.25	

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[a] Anovar = analysis of variance for repeated measures

[b] 0 = "Not at all" response, 1 = "A little" response, 2 = "Somewhat" response, 3 = "A lot" response to "Right now I feel..."

[c] Only F Probabilities of $\leq .05$ are presented

[d] One of the four schools involved had no grade 3, therefore two analyses were run for the 3rd-6th grades and 4th-6th grades

Table 6.18

Wetaskiwin: Anovar[a] for School on Sadness Items

SCHOOL ON ITEM	MEAN[b] MORN.	AFTRN.	F[c] PROB.	SCHOOL ON ITEM	MEAN MORN.	AFTRN.	F PROB.
2. Sad				5. Upset			
School by grade by Time			.025	School by time			.04
Grades 4-6[d]	.519	.458		Grades 4-6	.697	.694	
Norwood 4th	.591	.409		Norwood	1.000	.685	
5th	.938	.438		Centennial	.641	.748	
6th	.313	.313		Parkdale	.639	.701	
				McMurdo	.607	.589	
Centennial 4th	.684	.789					
5th	.423	.885					
6th	.359	.179					
Parkdale 4th	.481	.296					
5th	.686	.343					
6th	.543	.629					
McMurdo 4th	.278	.611					
5th	.400	.300					
6th	.444	.111					

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[a] Anovar = analysis of variance for repeated measures

[b] 0 = "Not at all" response, 1 = "A little" response, 2 = "Somewhat" response, 3 = "A lot" response to "Right now I feel..."

[c] Only F Probabilities of ≤ .05 are presented

[d] One of the four schools involved had no grade 3, therefore two analyses were run for the 3rd-6th grades and 4th-6th grades

Table 6.19

Wetaskiwin: Anovar[a] for School on Aggression Items

SCHOOL ON ITEM	MEAN[b] MORN	MEAN[b] AFTN	F[c] PROBABILITY
1. Bad-Tempered			
School (Grade 4-6)[d]			.025
Norwood	.556		
Centennial	.505		
Parkdale	.397		
McMurdo	.295		
School by grade by time	.375	.512	.005
Norwood 3rd	.190	.619	
4th	.500	.591	
5th	.625	.563	
6th	.250	.813	
Centennial 3rd	.333	.524	
4th	.605	.763	
5th	.231	.923	
6th	.385	.179	
Parkdale 3rd	.462	.692	
4th	.148	.444	
5th	.486	.343	
6th	.257	.657	
McMurdo 4th	.167	.000	
5th	.450	.250	
6th	.500	.389	
2. Bossy			
School (Grade 4-6)			.01
Norwood	.602		
Centennial	.437		
Parkdale	.345		
McMurdo	.304		
School by grade by time	.392	.430	.003
Norwood 3rd	.190	.619	
4th	.636	.636	
5th	.875	.563	
6th	.313	.563	
Centennial 3rd	.333	.429	
4th	.421	.579	
5th	.346	.692	
6th	.385	.256	
Parkdale 3rd	.462	.385	
4th	.259	.407	
5th	.600	.229	
6th	.257	.314	
McMurdo 4th	.278	.000	
5th	.200	.400	
6th	.389	.556	
3. Furious			
School by grade by time	.427	.603	.032
Norwood 3rd	.381	1.048	
4th	.545	.409	
5th	.563	.313	
6th	.500	.813	
Centennial 3rd	.429	.952	
4th	.526	.921	
5th	.308	.808	
6th	.282	.205	
Parkdale 3rd	.154	1.077	
4th	.593	.481	
5th	.571	.371	
6th	.143	.571	
McMurdo 4th	.722	.556	
5th	.550	.550	
6th	.222	.333	
4. Like Hitting			
School (Grades 3-6)			.048
Norwood	.773		
Centennial	.827		
Parkdale	.541		
McMurdo	.518		
(no grade 3)			
(Grades 4-6)			.016
Norwood	.787		
Centennial	.893		
Parkdale	.562		
McMurdo	.518		
School by grade by time	.605	.759	.001
Norwood			
4th	.273	.636	
5th	1.563	.625	
6th	.875	1.000	
Centennial			
4th	1.237	.921	
5th	.577	1.346	
6th	.692	.641	
Parkdale			
4th	.370	.667	
5th	.457	.486	
6th	.429	.943	
McMurdo 4th	.278	.389	
5th	.450	.550	
6th	.500	.944	

4. Like Hitting
(Grades 3-6)

School by grade by time by Sex	Male		Female	
		.048		
	.804	.931	.392	.574
Norwood 3rd	.857	1.071	.000	.571
4th	.167	.582	.400	.700
5th	2.333	1.111	.571	.000
6th	1.000	2.000	.818	.545
Centennial 3rd	.500	.917	.111	.333
4th	1.921	.789	1.053	1.053
5th	.867	1.467	.182	1.182
6th	1.000	.650	.368	.632
Parkdale 3rd	.571	.429	.000	.500
4th	.462	.692	.286	.643
5th	.667	.833	.235	.118
6th	.579	1.158	.250	.688
McMurdo 4th	.167	1.000	.333	.083
5th	.500	.875	.417	.333
6th	.667	.917	.167	1.000

5. Mean

School (Grade 4-6)			.036
Norwood	.676		
Centennial	.631		
Parkdale	.454		
McMurdo	.393		
School by grade by time	.493	.608	.002
Norwood 3rd	.571	.762	
4th	.455	.636	
5th	1.313	.563	
6th	.625	.563	
Centennial 3rd	.333	.667	
4th	.816	.816	
5th	.308	.885	
6th	.513	.436	
Parkdale 3rd	.462	.923	
4th	.185	.630	
5th	.429	.343	
6th	.457	.657	
McMurdo 4th	.167	.222	
5th	.450	.500	
6th	.389	.611	
School by sex by time			.006
Male	.685		
Norwood	.725	1.000	
Centennial	.667	.697	
Parkdale	.456	.789	
McMurdo (no grade 3)	.462	.654	
Female	.406		
Norwood	.686	.229	
Centennial	.379	.672	
Parkdale	.302	.358	
McMurdo (no grade 3)	.233	.267	

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[a] Anovar = analysis of variance for repeated measures

[b] 0 = "Not at all" response, 1 = "A little" response, 2 = "Somewhat" response, 3 = "A lot" response to "Right now I feel..."

[c] Only F-Probabilities of $\leq .05$ are presented

[d] One of the four schools involved had no grade 3, therefore two analyses were run for the 3rd-6th grades and 4th-6th grades

Table 6.20

Wetaskiwin: Anovar[a] for School on Mastery/Self-Esteem Items

SCHOOL ON ITEM	MEAN[b] MORN	MEAN[b] AFTN			F[c] PROBABILITY
1. Brave					
School (Grades 3-6)					.007
Norwood	1.953				
Centennial	1.786				
Parkdale	1.868				
McMurdo	1.491				
(no grade 3)					
Grades 4-6[d]					.004
Norwood	2.019				
Centennial	1.820				
Parkdale	1.825				
McMurdo	1.491				
School by grade by time by sex					.015
	Male		Female		
	1.963	2.042	1.625	1.540	
Norwood 3rd	2.000	1.857	1.429	1.571	
4th	2.167	2.167	1.800	1.900	
5th	2.333	2.111	1.857	2.571	
6th	1.400	2.400	1.636	1.909	
Centennial 3rd	2.083	2.250	1.333	.444	
4th	2.105	2.421	1.579	1.579	
5th	1.667	2.000	2.182	1.364	
6th	2.050	1.850	1.368	1.632	
Parkdale 3rd	2.429	1.857	2.000	2.500	
4th	1.846	2.154	1.786	1.643	
5th	2.167	2.389	1.824	1.471	
6th	1.842	1.895	1.563	1.250	
McMurdo 4th	1.833	1.833	2.083	1.583	
5th	2.000	2.000	1.000	1.250	
6th	1.333	1.333	.833	.833	
2. Handsome or Pretty					
School (Grades 3-6)					.001
Norwood	1.893				
Centennial	1.363				
Parkdale	1.745				
McMurdo	1.402				
(no grade 3)					
Grades 4-6					.001
Norwood	2.046				
Centennial	1.330				
Parkdale	1.701				
McMurdo	1.402				
School by grade					.012
	Grade 3	Grade 4	Grade 5	Grade 6	
	1.643	1.529	1.747	1.491	
Norwood	1.339	2.045	2.625	1.469	
Centennial	1.514	1.211	1.500	1.333	
Parkdale	2.072	1.519	1.814	1.729	
McMurdo	(no grade 3)	1.583	1.250	1.389	

SCHOOL ON ITEM	MEAN MORN	MEAN AFTN			F PROBABILITY
2. Handsome or Pretty					
School by sex Grades 4-6					.034
	Male		Female		
	1.741		1.435		
Norwood	2.192		1.911		
Centennial	1.389		1.265		
Parkdale	1.800		1.596		
McMurdo	1.827		1.033		
3. Powerful					
School by time by sex					.047
	Male		Female		
	1.698	1.931	.955	1.273	
Norwood	1.800	1.925	1.314	1.543	
Centennial	1.697	2.015	1.052	1.190	
Parkdale	1.667	1.947	.849	1.170	
McMurdo	1.615	1.692	.533	1.300	
(no grade 3)					
4. Strong					
School (Grades 3-6)					.029
Norwood	1.907				
Centennial	1.645				
Parkdale	1.745				
McMurdo	1.473				
(no grade 3)					
Grades 4-6					.03
Norwood	1.935				
Centennial	1.636				
Parkdale	1.701				
McMurdo	1.473				
School by sex Grades 4-6					.05
	Male		Female		
Norwood	2.038		1.839		
Centennial	1.917		1.327		
Parkdale	2.090		1.287		
McMurdo	1.942		1.067		

5. Tough		
School (Grades 3-6)		.044
Norwood	1.680	
Centennial	1.431	
Parkdale	1.436	
McMurdo	1.241	
(no grade 3)		
Grades 4-6		.05
Norwood	1.676	
Centennial	1.422	
Parkdale	1.366	
McMurdo	1.241	

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[a] Anovar = analysis of variance for repeated measures

[b] 0 = "Not at all" response, 1 = "A little" response, 2 = "Somewhat" response, 3 = "A lot" response to "Right now I feel..."

[c] Only F Probabilities of .05 are presented

[d] One of the four schools involved had no grade 3, therefore two analyses were run for the 3rd-6th grades and 4th-6th grades

Table 6.21

Wetaskiwin: Anovar[a] for Sex & Grade on Surgency Items

Mood Item	Mean[b] Morn	Aftrn	F[c] Prob
1. Cheerful			
Grades 3-6			.001
female	2.210		
male	1.910		
Grades 4-6[d]			.001
female	2.221		
male	1.859		
2. Glad			
Grades 3-6			.017
female	2.111		
male	1.931		
Grades 4-6			.002
grade 4	2.186		
grade 5	1.923		
grade 6	1.912		
3. Joyful			
Sex: Grades 3-6			.021
female	2.054		
	1.938	2.170	
sex-by-time			.003
male	1.841		
	1.894	1.788	
grade-by-time			.002
grade 3	2.145	1.818	
grade 4	2.086	1.943	
grade 5	1.660	2.010	
grade 6	1.861	2.046	
Sex: Grades 4-6			.033
female	2.049		
male	1.827		
grade-by-time			.005
grade 4	2.086	1.943	
grade 5	1.660	2.010	
grade 6	1.861	2.046	
3. Joyful (con't)			
sex-by-grade-by-time			.018
female: 4th	2.145	2.091	
5th	1.553	2.255	
6th	2.019	2.192	
male: 4th	2.020	1.780	
5th	1.760	1.780	
6th	1.714	1.911	
4. Like Smiling			
Sex: Grades 3-6			.001
female	2.065		
	1.932	2.199	
sex-by-time			.050
male	1.693		
	1.688	1.698	
grade-by-time			.002
grade 4	1.962	1.914	
grade 5	1.701	2.021	
grade 6	1.620	2.000	

---

[a] Anovar = analysis of variance for repeated measures

[b] 0 = "Not at all" response, 1 = "A little" response, 2 = "Somewhat" response, 3 = "A lot" response to "Right now I feel..."

[c] Only F probabilities of ≤.05 are presented

[d] One of the four schools involved had no grade 3, therefore two analyses were run for the 3rd-6th grades and 4th-6th grades

Table 6.22

Wetaskiwin: Anovar[a] for Sex and Grade on Sadness Items

Mood Item	Effect	Mean[b]		F Probability[c]
		Morning	Afternoon	
1. Lonely				
Grades 3-6				
grade-by-time				.050
grade 3		.782	.655	
grade 4		.667	.762	
grade 5		.825	.526	
grade 6		.583	.472	
2. Sad				
Grades 4-6[d]				
sex-by-grades				.046
Female:	grade 4	.745		
	grade 5	.468		
	grade 6	.433		
Male:	grade 4	.330		
	grade 5	.620		
	grade 6	.330		

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[a] Anovar = analysis of variance for repeated measures

[b] 0 = "Not at all" response, 1 = "A little" response, 2 = "Somewhat" response, 3 = "A lot" response to "Right now I feel..."

[c] Only F probabilities of ≤ .05 are presented

[d] One of the four schools involved had no grade 3, therefore two analyses were run for the 3rd-6th grades and 4th-6th grades

Table 6.23

Wetaskiwin: Anovar[a] for Sex & Grade on Aggression Items

Mood Item	Mean	Morn	Aftrn	F Prob
1. Bad-tempered				
Sex: Grades 3-6				.002
female	.347	.341	.352	
sex-by-time				.018
male	.534	.407	.661	
Sex: Grades 4-6[d]				.022
female	.360	.357	.364	
sex-by-time				.022
male	.522	.417	.628	
2. Bossy				
Sex: Grades 3-6				.001
female	.273	.307	.239	
sex-by-time				.007
male	.540	.471	.608	
Sex: Grades 4-6				.001
female	.286	.312	.260	
sex-by-time				.029
male	.538	.500	.577	
sex-by-grade				.050
Female: grade 4	.355			
grade 5	.245			
grade 6	.250			
Male: grade 4	.500			
grade 5	.680			
grade 6	.446			
3. Furious				
Sex: Grades 3-6				.040
female	.435	.415	.455	
sex-by-time				.043
male	.590	.439	.741	
grade and				.013
grade-by-time				.001
grade 3	.682	.345	1.018	
grade 4	.610	.581	.638	
grade 5	.505	.495	.515	
grade 6	.347	.259	.435	
3. Furious (con't)				
Sex: Grades 4-6				.025
female	.412	.429	.396	
sex-by-time				.025
male	.558	.455	.660	
4. Like Hitting				
Sex: Grades 3-6				.001
female	.483			
male	.868			
Sex: Grades 4-6				.001
sex-by-grades				.048
Female:	.516			
grade 4	.623			
grade 5	.362			
grade 6	.538			
Male:	.888			
grade 4	.730			
grade 5	1.040			
grade 6	.893			
5. Mean				
Sex: Grades 3-6				.001
female	.406	.392	.420	
sex-by-time				.044
male	.685	.587	.783	
sex-by-grade-by-time				.018
Female:				
grade 3		.409	.273	
grade 4		.364	.564	
grade 5		.468	.234	
grade 6		.346	.500	
Male:				
grade 3		.485	1.091	
grade 4		.580	.700	
grade 5		.620	.860	
grade 6		.625	.607	
Sex: Grades 4-6				.002
female	.416			
male	.663			

Table 6.24

Wetaskiwin: Anovar[a] for Sex & Grade on Mastery/Self-Esteem

Mood Item	Overall[b] Mean	F[c] Prob
1. Brave		
Sex: Grades 3-6		.001
female	1.582	
male	2.003	
Sex: Grades 4-6[d]		.001
female	1.601	
male	1.990	
Grades		.013
grade 4	1.910	
grade 5	1.866	
grade 6	1.625	
2. Handsome (or) Pretty		
Sex: Grades 3-6		.002
female	1.435	
male	1.741	
Sex: Grades 4-6		.004
female	1.438	
male	1.728	
Grades		.024
grade 4	1.529	
grade 5	1.747	
grade 6	1.491	
3. Powerful		
Sex: Grades 3-6		.001
female	1.114	
male	1.815	
Sex: Grades 4-6		.001
female	1.123	
male	1.772	
4. Strong		
Sex: Grades 3-6		.001
female	1.349	
male	2.032	
Sex: Grades 4-6		.001
female	1.357	
male	1.997	
5. Tough		
Sex: Grades 3-6		.001
female	1.054	
male	1.828	
Sex: Grades 4-6		.001
female	1.026	
male	1.801	

---

[a] Anovar = analysis of variance for repeated measures

[b] 0 = "Not at all" response, 1 = "A little" response, 2 = "Somewhat" response, 3 = "A lot" response to "Right now I feel..."

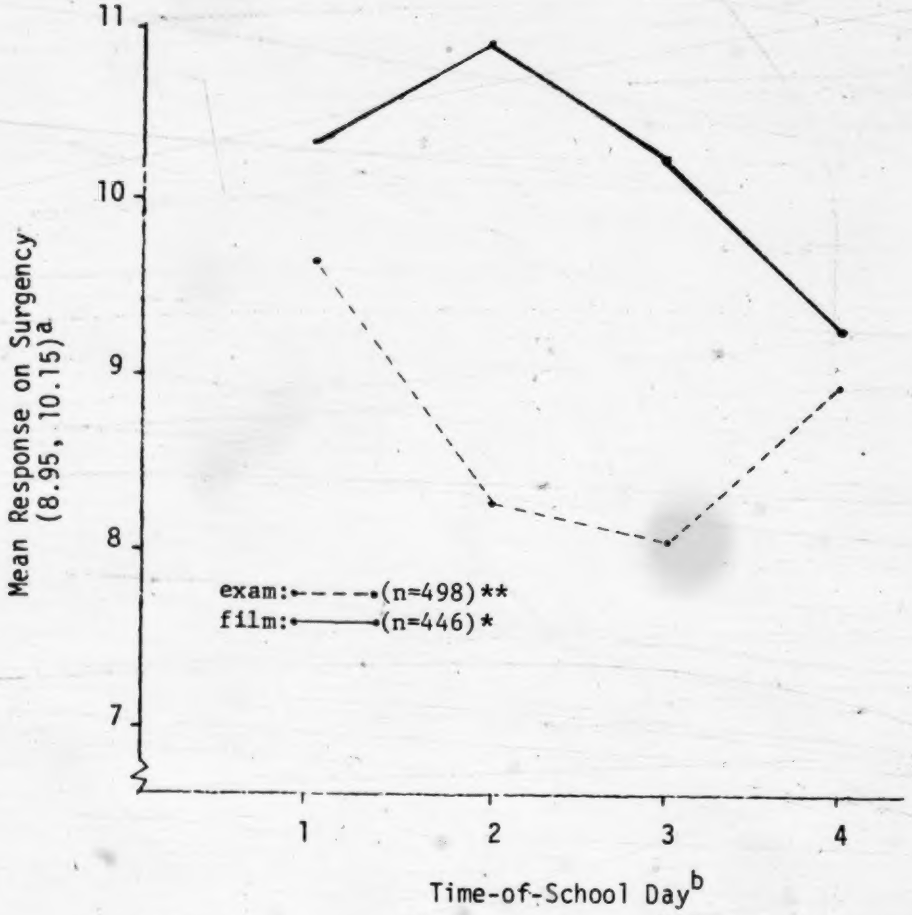
[c] Only F probabilities of ≤ .05 are presented

[d] One of the four schools involved had no grade 3, therefore two analyses were run for the 3rd-6th grades and 4th-6th grades

FIGURES FOR CHAPTER VI

Figure 1

Diurnal Variation on the Mood of Surgency:
Exam versus Film

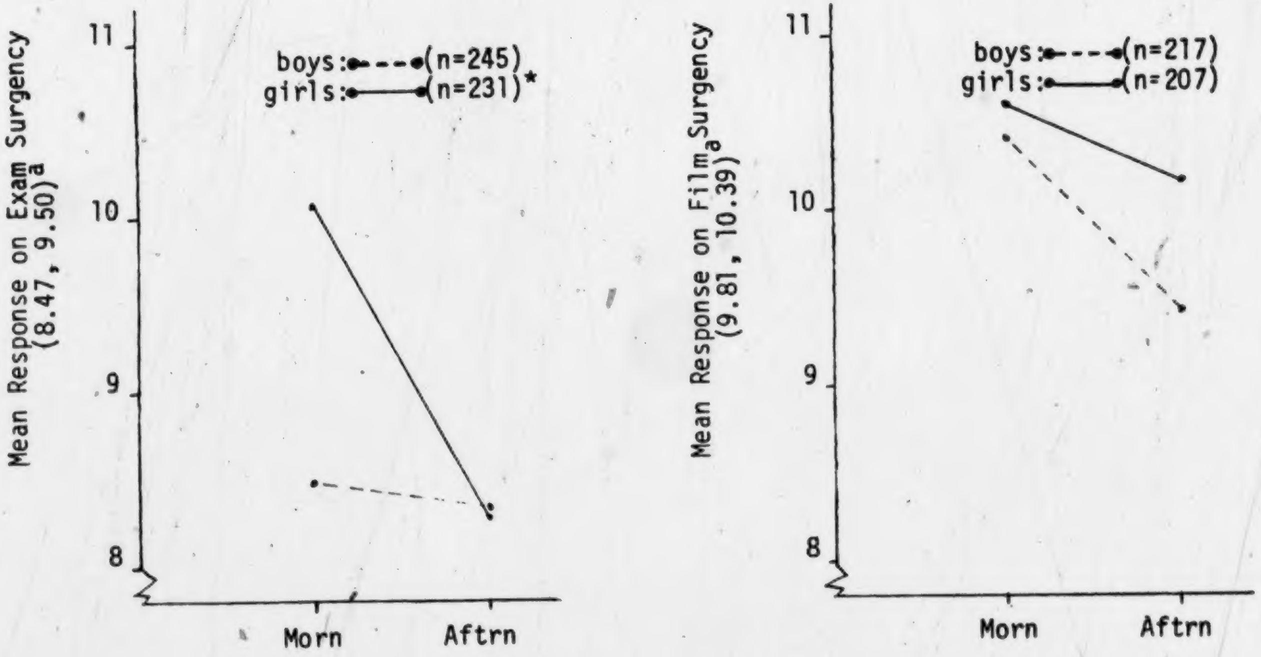


*sig ≤.03
**sig ≤.01

[a] Numbers in parentheses denote grand means for exam and film, respectively--sig ≤.001

[b] Time period 1 = First period of the day, 2 = 10 A.M. to lunch, 3 = After lunch to 2 P.M., 4 = Last period of the day

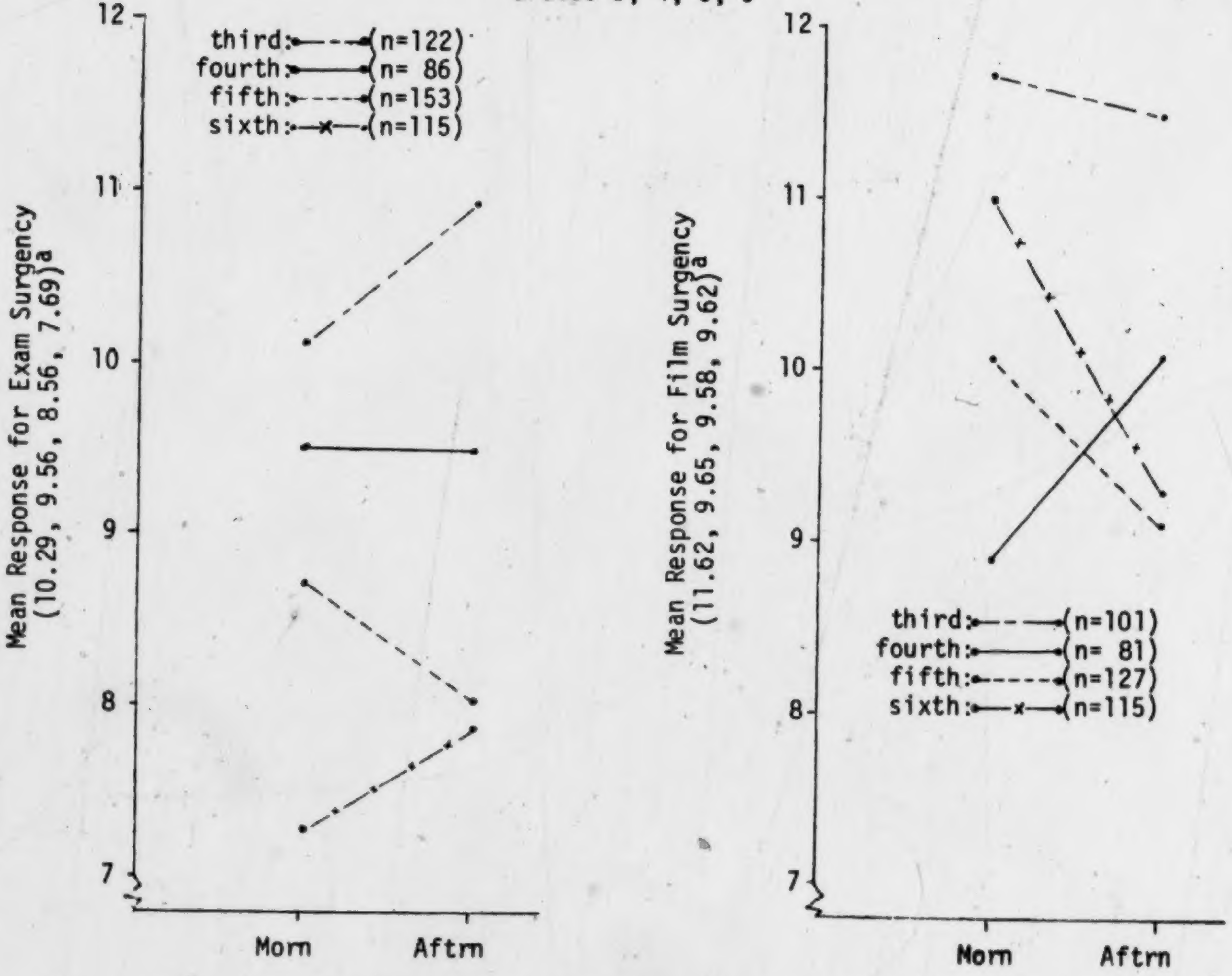
Figure 2
Diurnal Variation on the Mood of Surgency:
Boys & Girls



^{a}Numbers in parentheses denote grand means for males and females, respectively
*sig $\leq$ .005

Figure 3

Diurnal Variation on the Mood of Surgency:
Grades 3, 4, 5, 6



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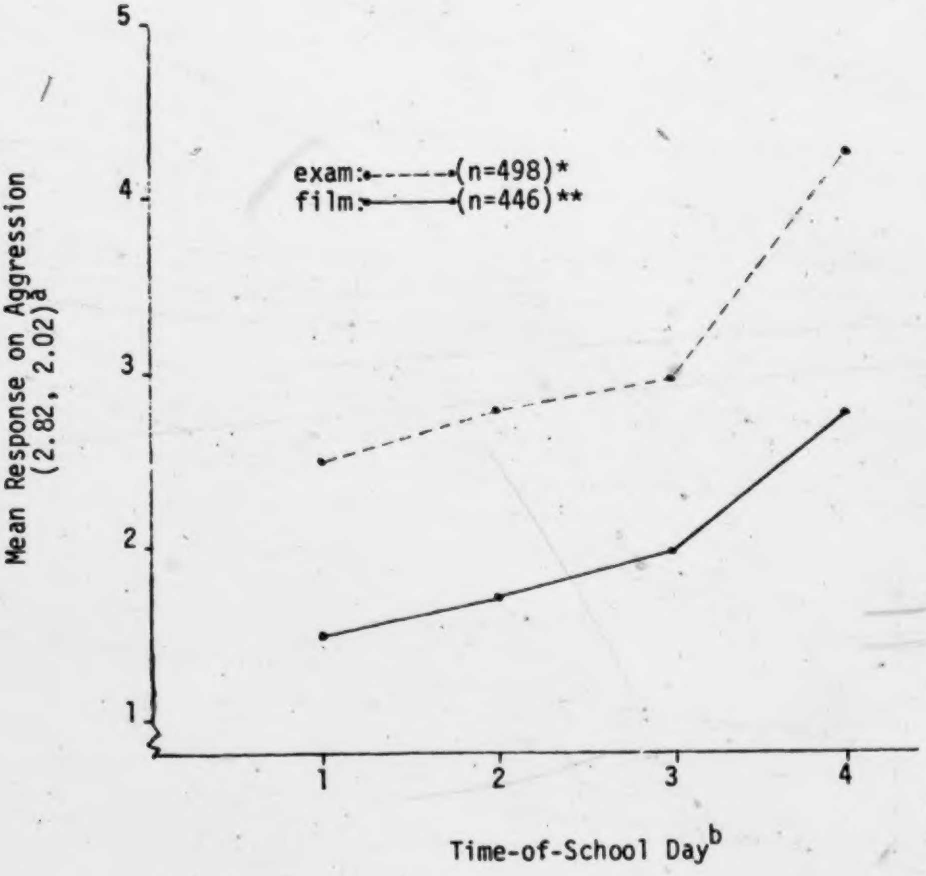
[a] Numbers in parentheses denote grand means for grades 3, 4, 5, and 6, respectively

Figure 4

Diurnal Variation on the Mood Of Aggression: Exam versus Film



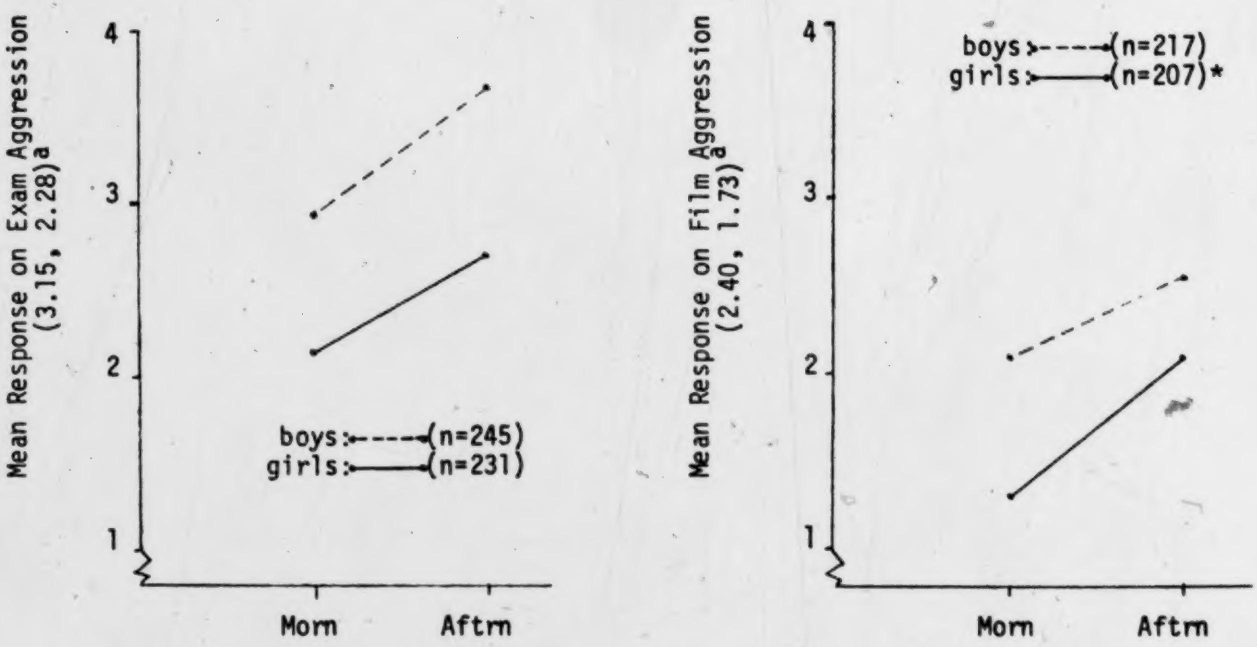
*sig≤.01
**sig≤.005

[a] Numbers in parentheses denote grand means for exam and film, respectively--sig≤.002

[b] Time period 1 = First period of the day, 2 = 10 A.M. to lunch, 3 = After lunch to 2 P.M., 4 = Last period of the day

Figure 5

Diurnal Variation on the Mood of Aggression:
Boys & Girls

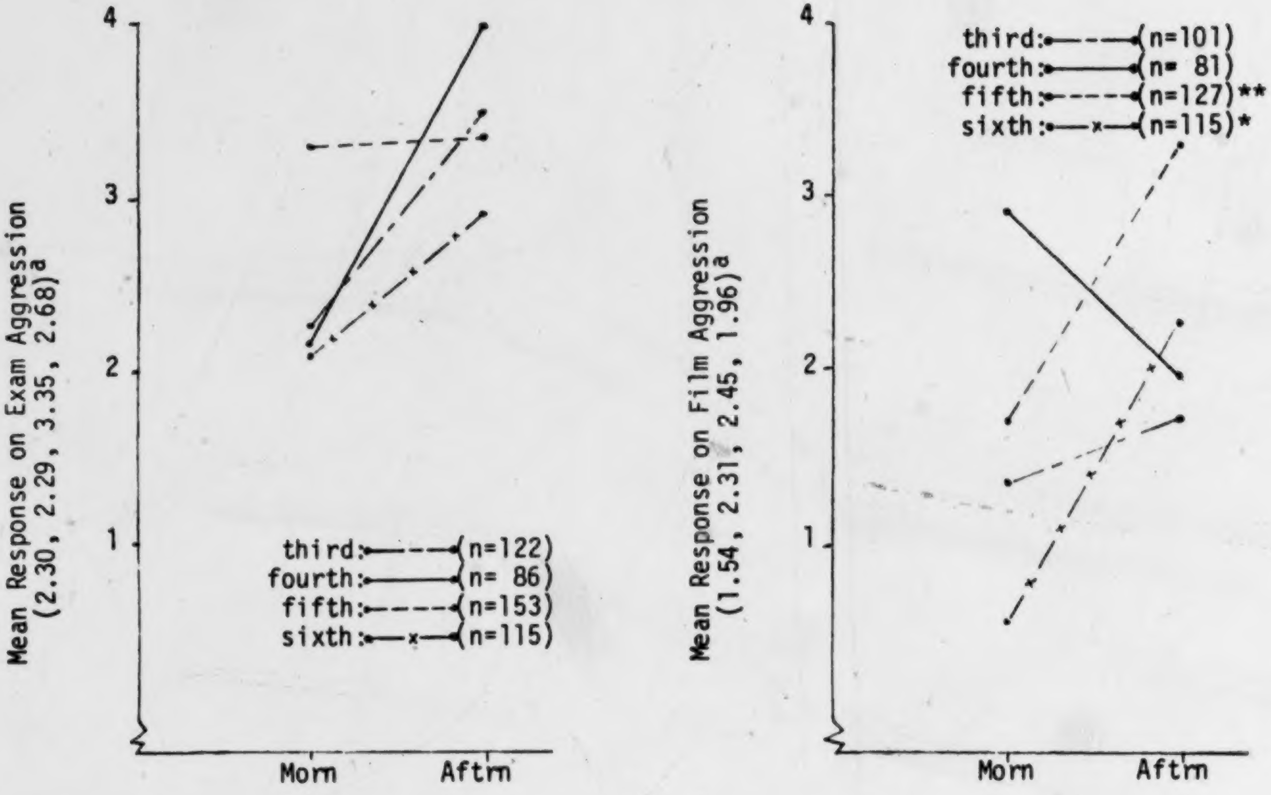


[a] Numbers in parentheses denote grand means for males and females, respectively

*sig $\leq$ .03

Figure 6

Diurnal Variation on the Mood of Aggression:
Grades 3, 4, 5, & 6



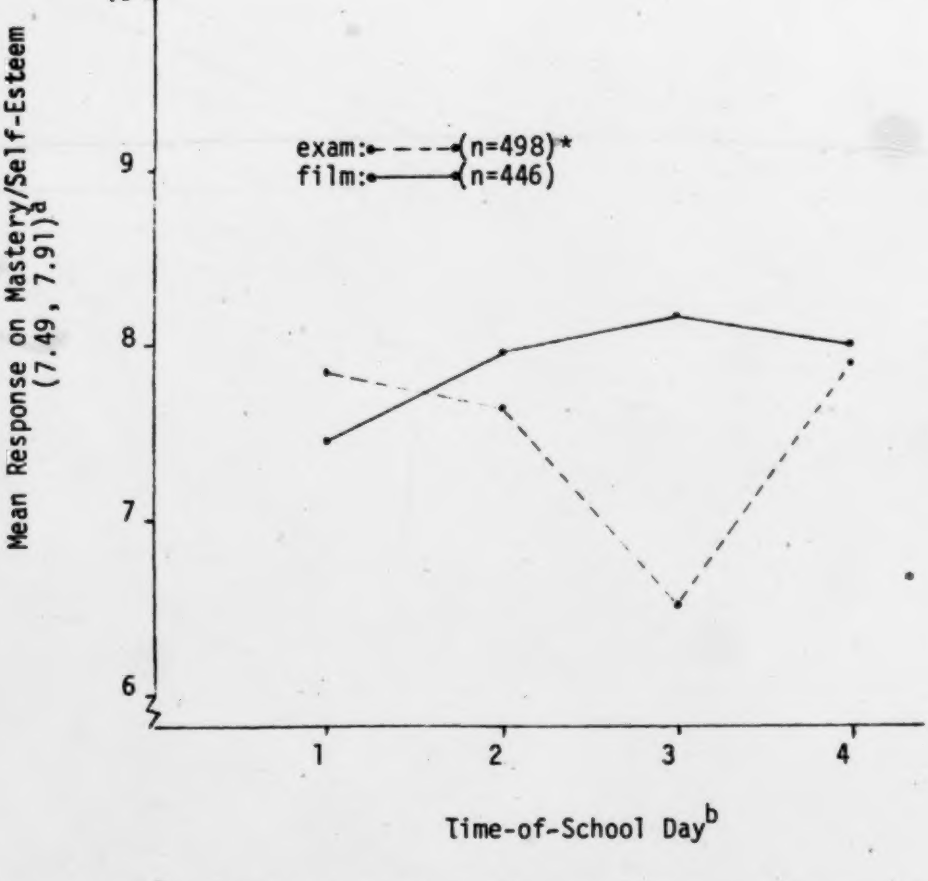
[a] Numbers in parentheses denote grand means for grades 3, 4, 5, and 6, respectively

*sig $\leq .03$

**sig $\leq .01$

Figure 7

Diurnal Variation on the Mood of Mastery/Self-Esteem: Exam versus Film

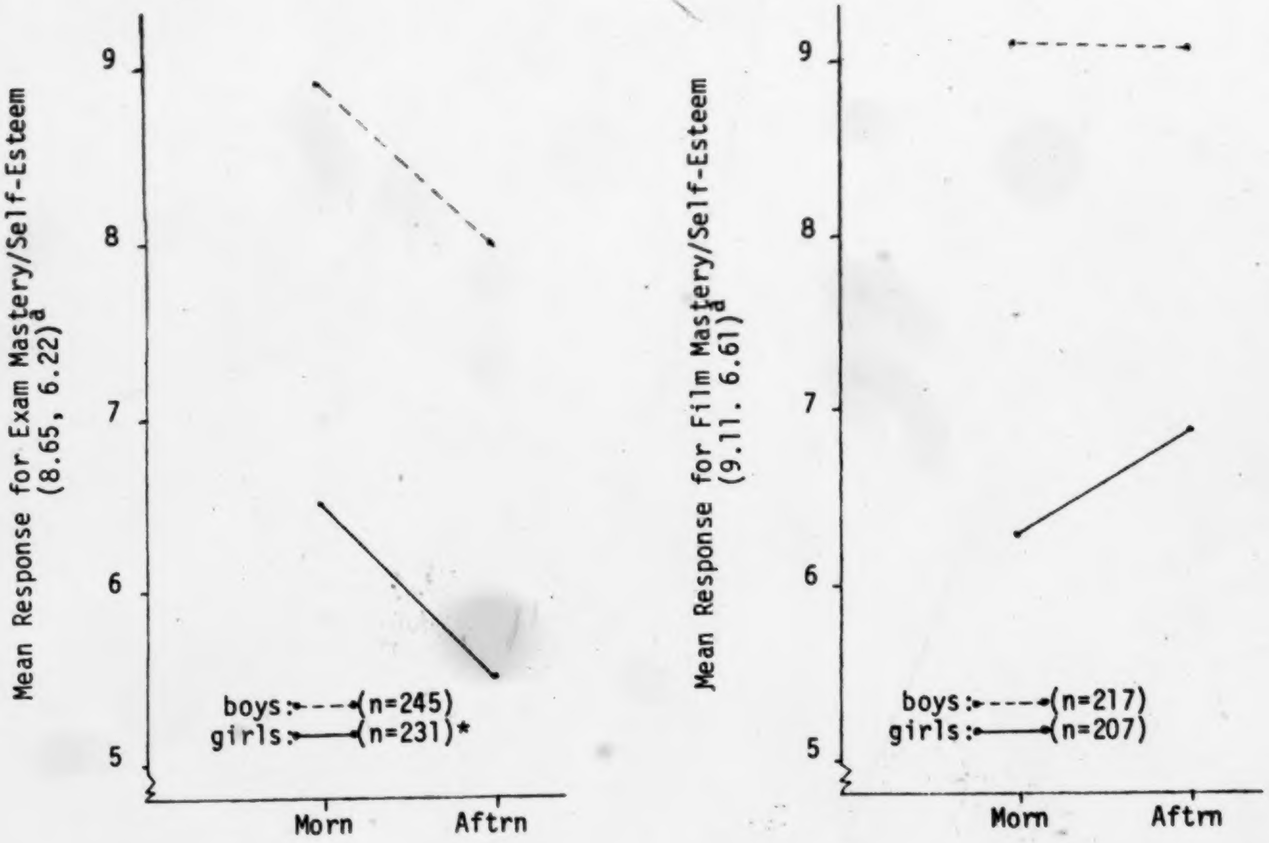


[a] Numbers in parentheses denote grand means for exam and film, respectively--sig ≤ .004

[b] Time periods 1 = First period of the day, 2 = 10 A.M. to lunch, 3 = After lunch to 2 P.M., 4 = Last period of the day

*sig ≤ .01

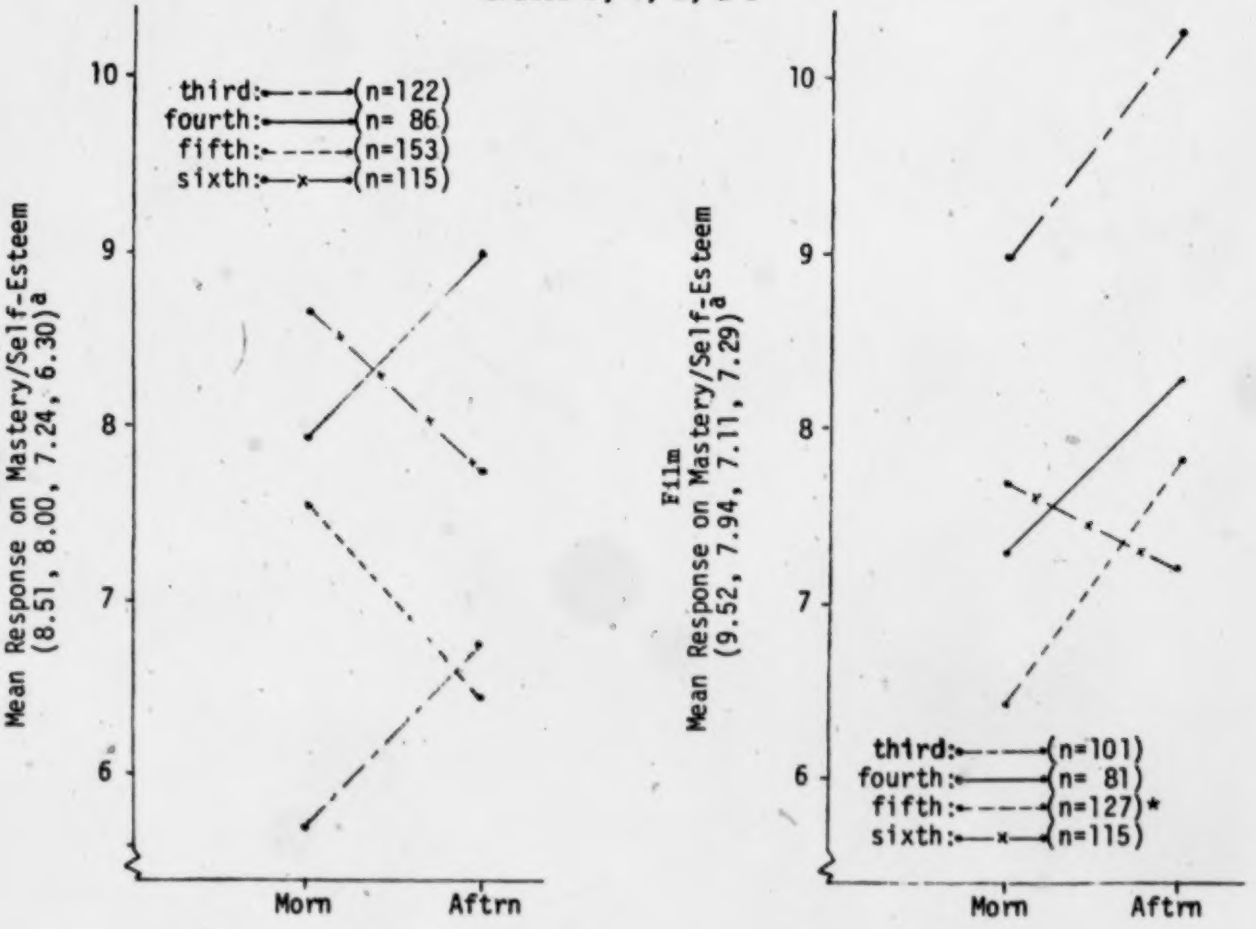
Figure 8
Diurnal Variation on the Mood of Mastery/Self-Esteem:
Boys & Girls



[a] Numbers in parentheses denote grand means for males and females, respectively

*sig$\leq$.05

Figure 9
Diurnal Variation on the Mood of Mastery/Self-Esteem:
Grades 3, 4, 5, & 6

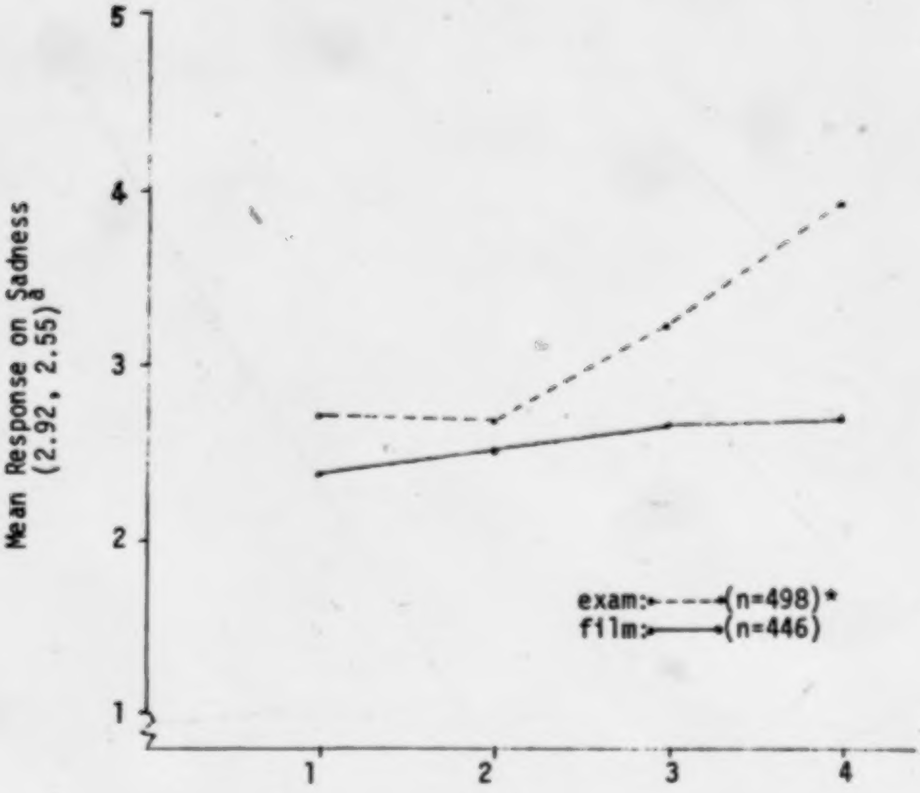


[a] Numbers in parentheses denote grand means for grades 3, 4, 5, and 6, respectively

*sig ≤ .05

Figure 10

Diurnal Variation on the Mood of Sadness: Exam versus Film



Time-of-School Day[b]

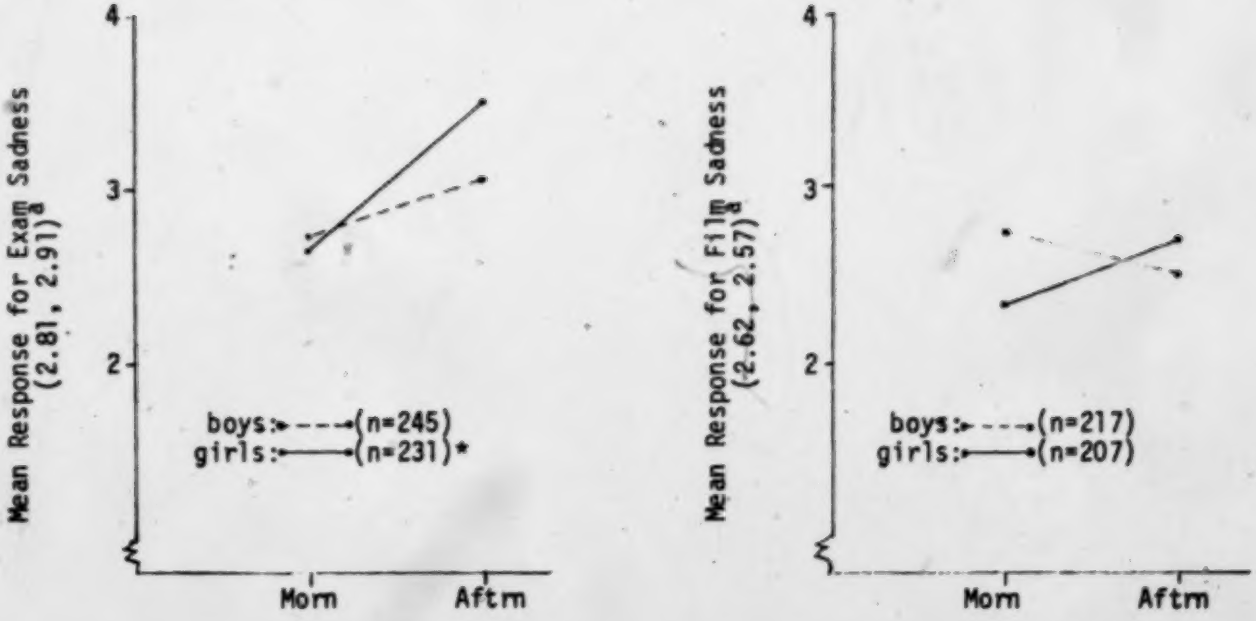
[a] Numbers in parentheses denote grand means for exam and film, respectively

[b] Time periods 1 = First period of the day, 2 = 10 A.M. to lunch, 3 = After lunch to 2 P.M., 4 = Last period of the day

*sig ≤ .05

Figure 11

Diurnal Variation on the Mood of Sadness:
Boys & Girls

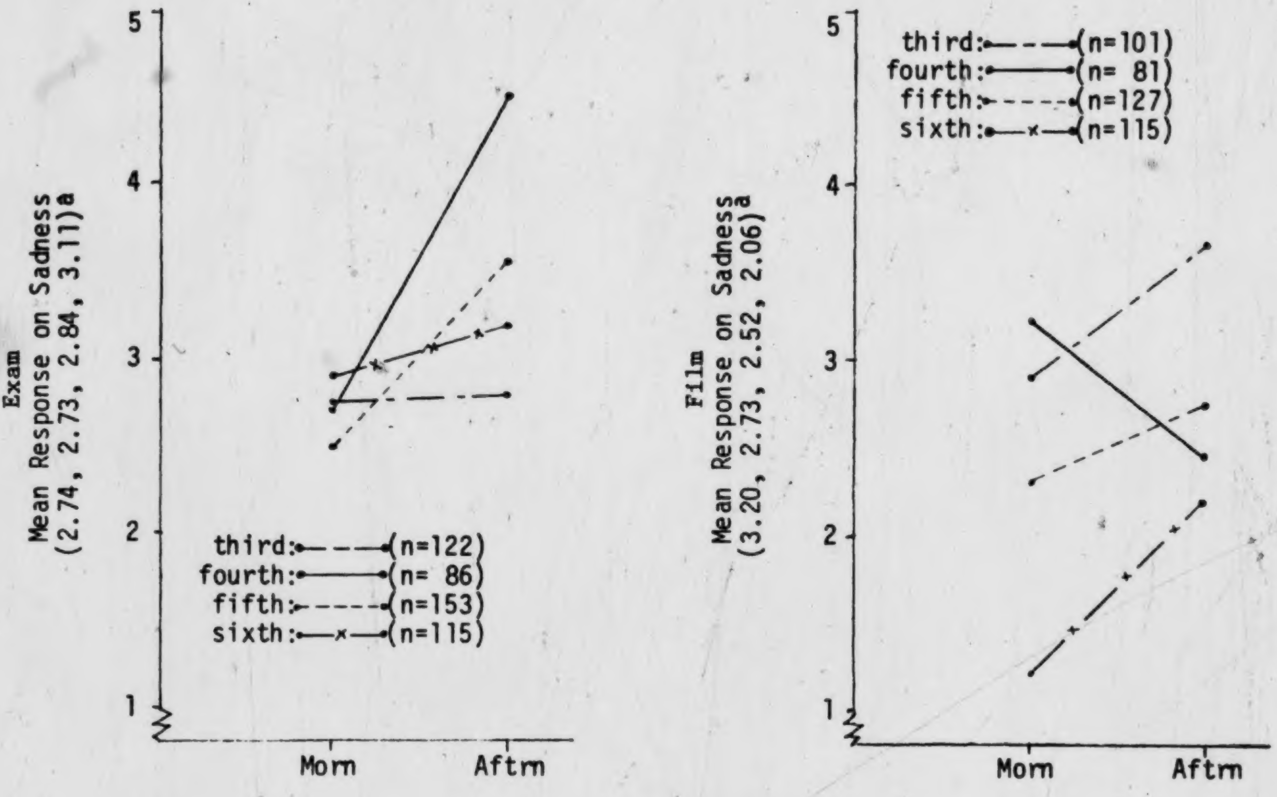


[a] Numbers in parentheses denote grand means for males and females, respectively

*sig $\leq .05$

Figure 12

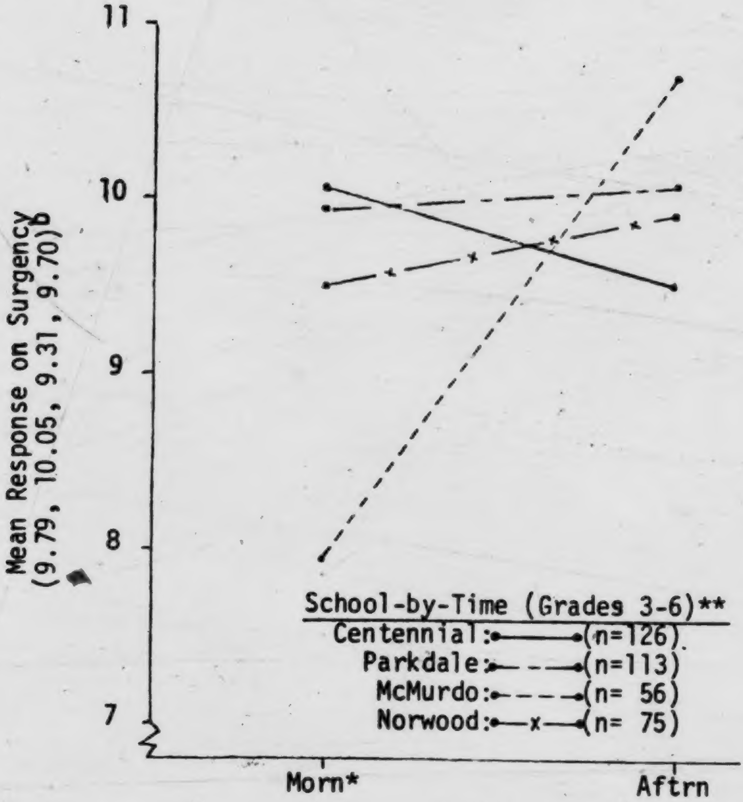
Diurnal Variation on the Mood of Sadness
Grades 3, 4, 5, & 6



[a] Numbers in parentheses denote grand means for grades 3, 4, 5, and 6, respectively

Figure 13

Diurnal Variation on the Mood of Surgency: Schools[a]



Time-of-School Day

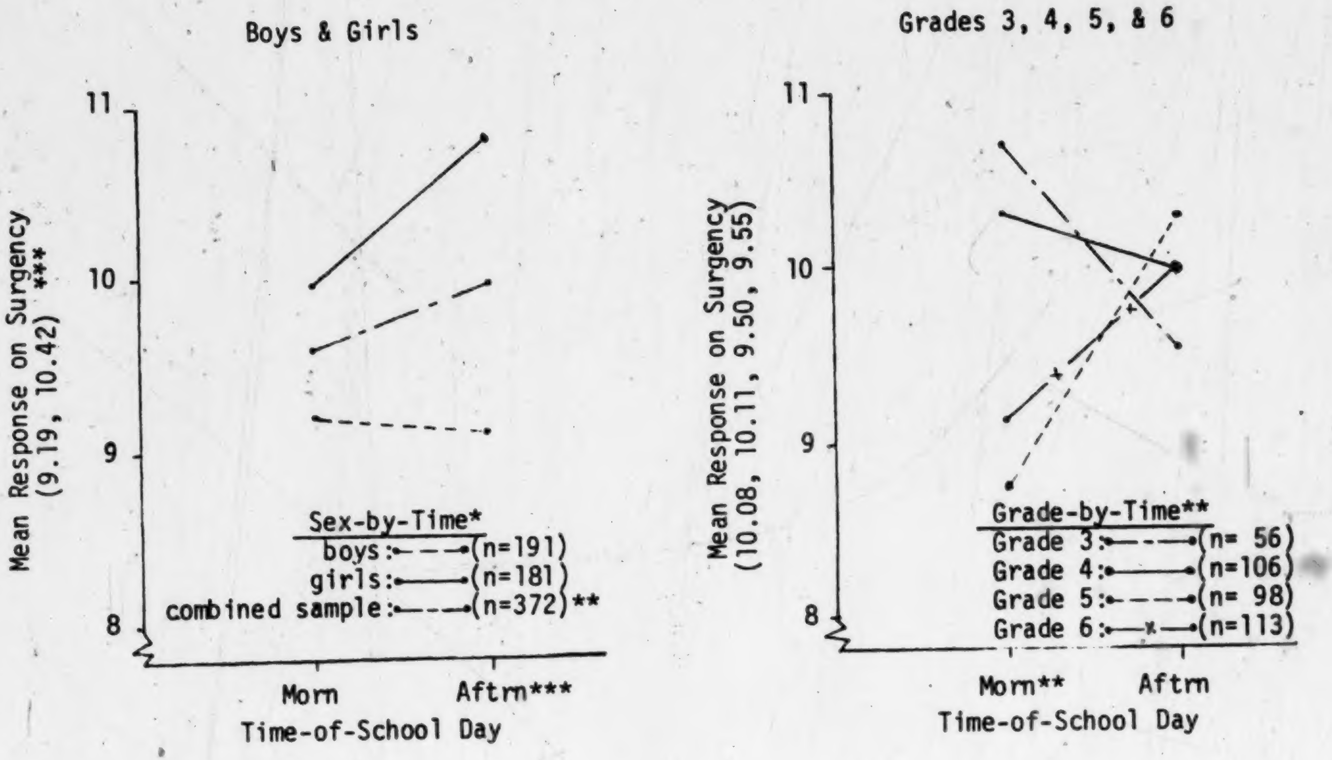
[a] Schools: Centennial = Control, Parkdale = Light change only, McMurdo = Color change only, Norwood = Light & color change

[b] Numbers in parentheses denote grand means for grades 3 - 6 at Centennial, Parkdale, McMurdo, and Norwood, respectively (no grade 3 at McMurdo)

*sig ≤ .01
**sig ≤ .001

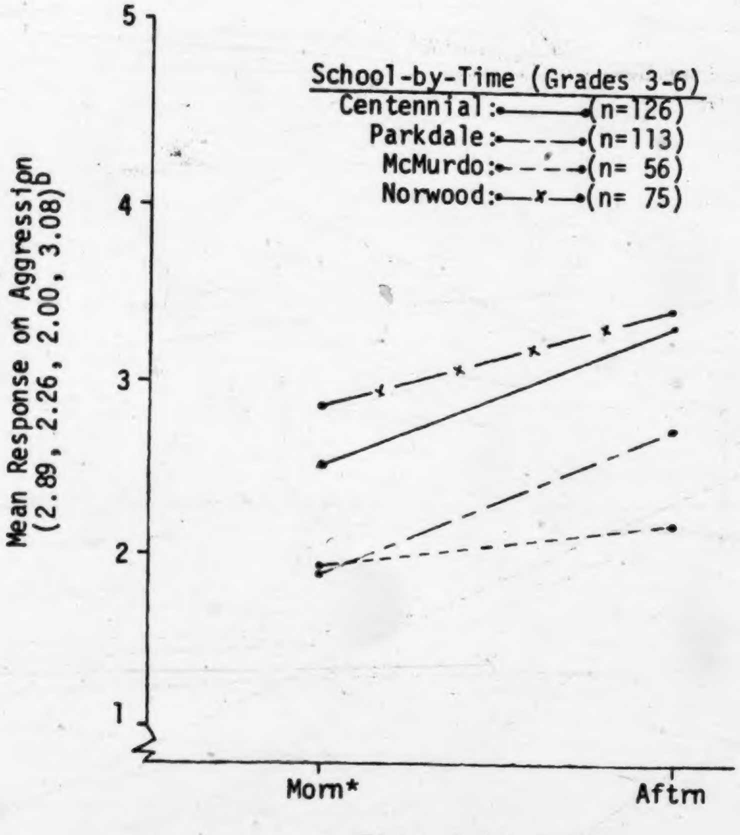
Figure 14

Diurnal Variation on the Mood of Surgency: Wetaskiwin Sample



*sig ≤ .025
**sig ≤ .005
***sig ≤ .001

Figure 15
Diurnal Variation on the Mood of Aggression: Schools[a]



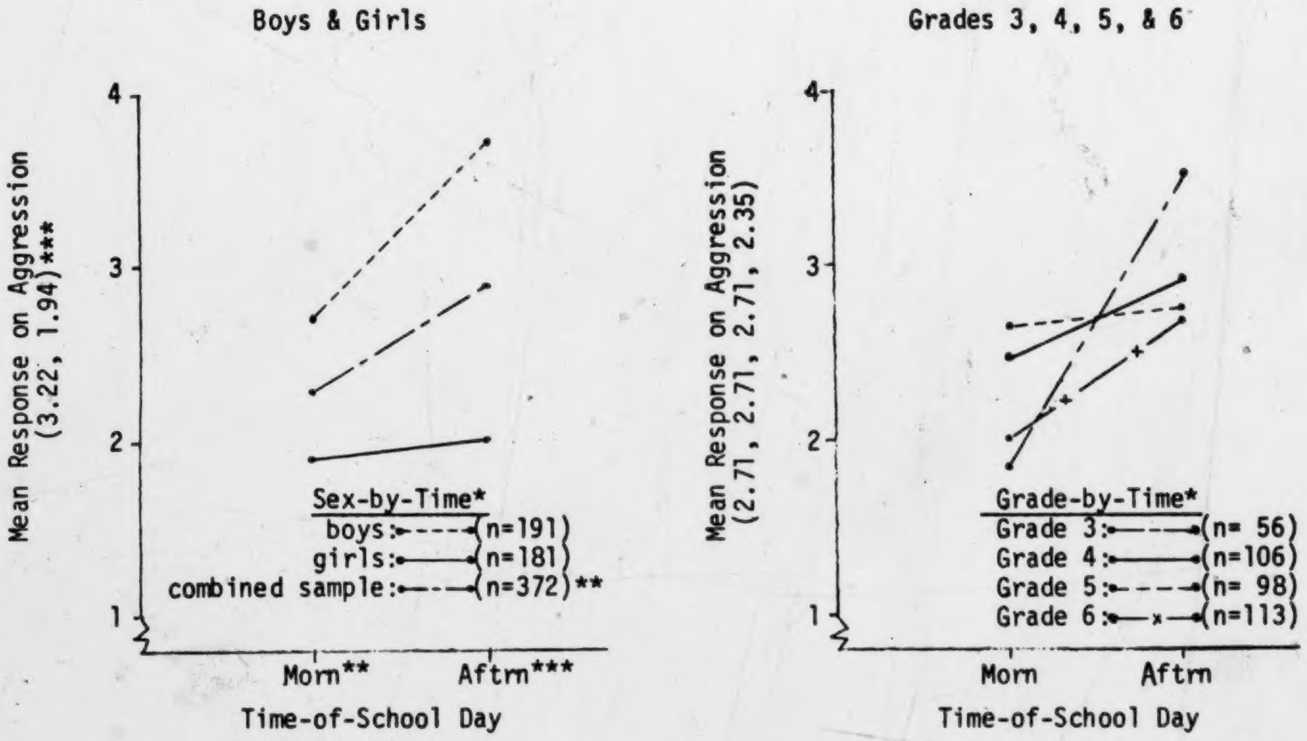
[a] Schools: Centennial = Control, Parkdale = Light change only, McMurdo = Color change only, Norwood = Light & color change

[b] Numbers in parentheses denote grand means for grades 3 - 6 at Centennial, Parkdale, McMurdo, and Norwood, respectively (no grade 3 at McMurdo)--sig $\leq$.05

*sig $\leq$.05

Figure 16

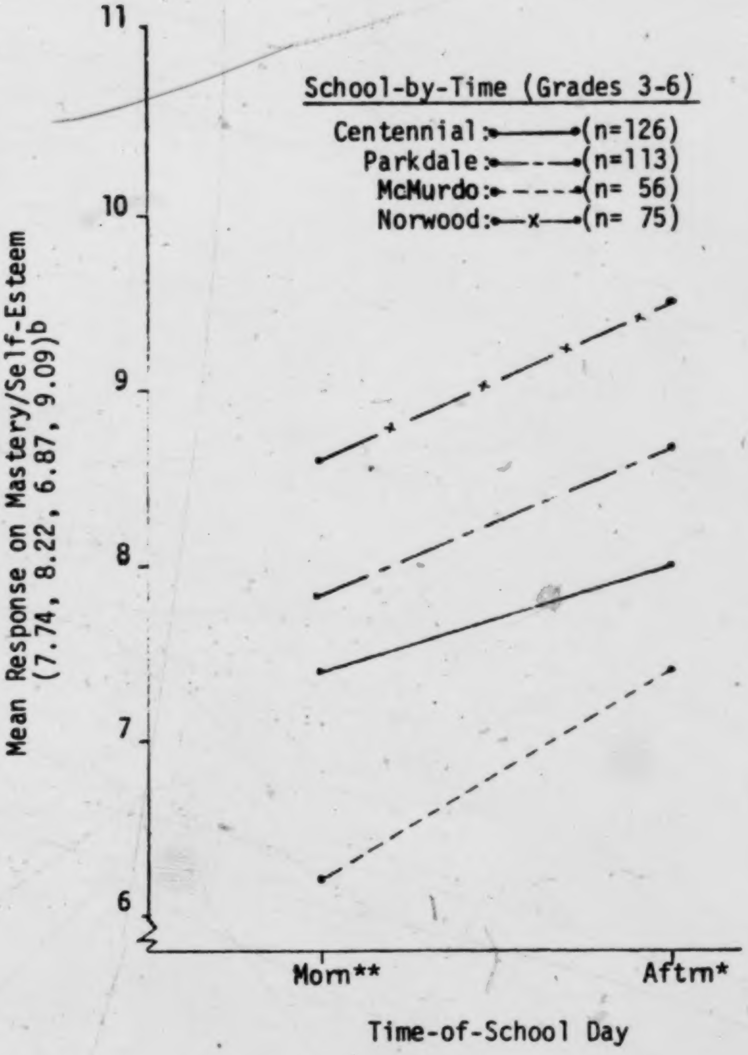
Diurnal Variation on the Mood of Aggression: Wetaskiwin Sample



*sig ≤ .05
**sig ≤ .005
***sig ≤ .001

Figure 17

Diurnal Variation on the Mood of Mastery/Self-Esteem: Schools[a]



[a] Schools: Centennial = Control, Parkdale = Light change only, McMurdo = Color change only, Norwood = Light & color change

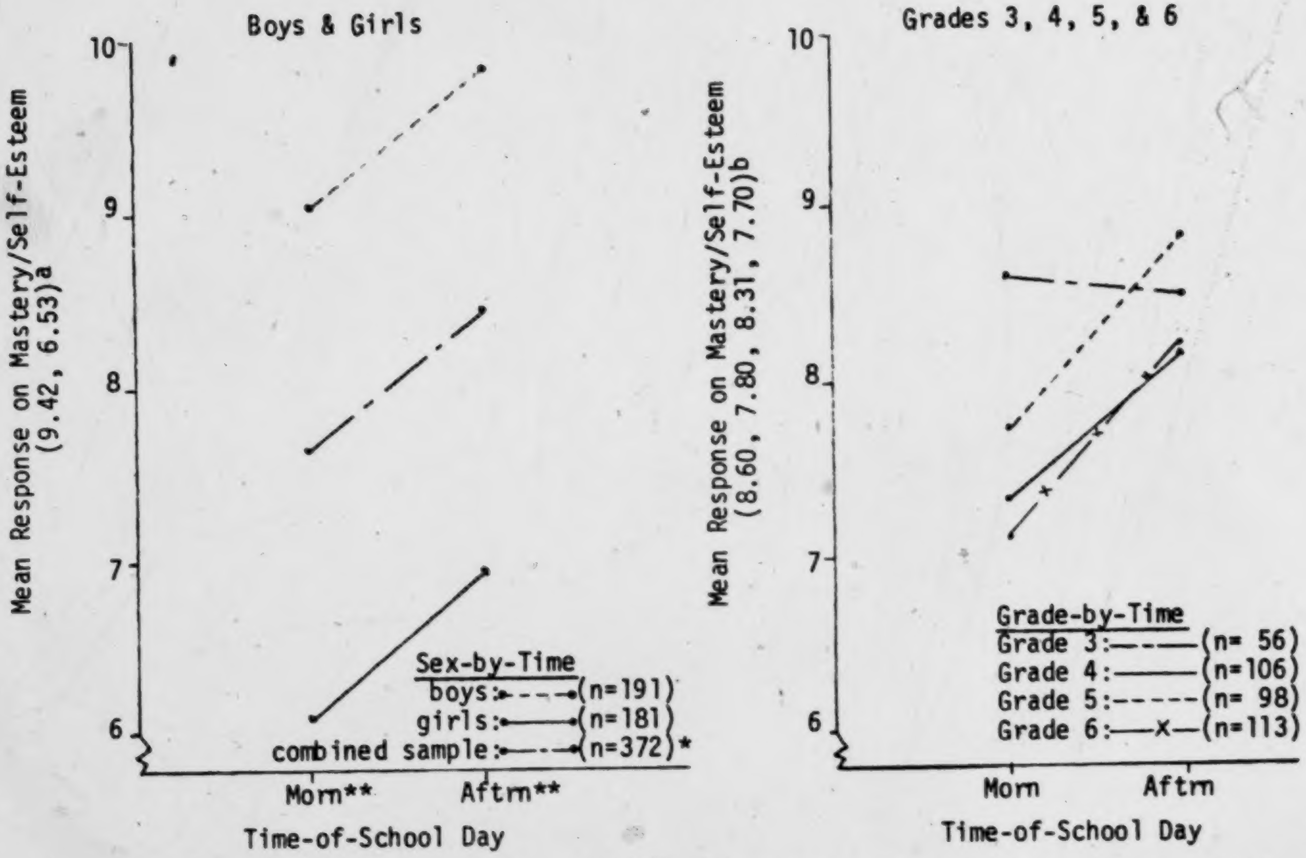
[b] Numbers in parentheses denote grand means for grades 3 - 6 at Centennial, Parkdale, McMurdo, and Norwood, respectively (no grade 3 at McMurdo)--sig $\leq$.002

*sig $\leq$.018

**sig $\leq$.008

Figure 18

Diurnal Variation on the Mood of Mastery/Self-Esteem: Wetaskiwin Sample



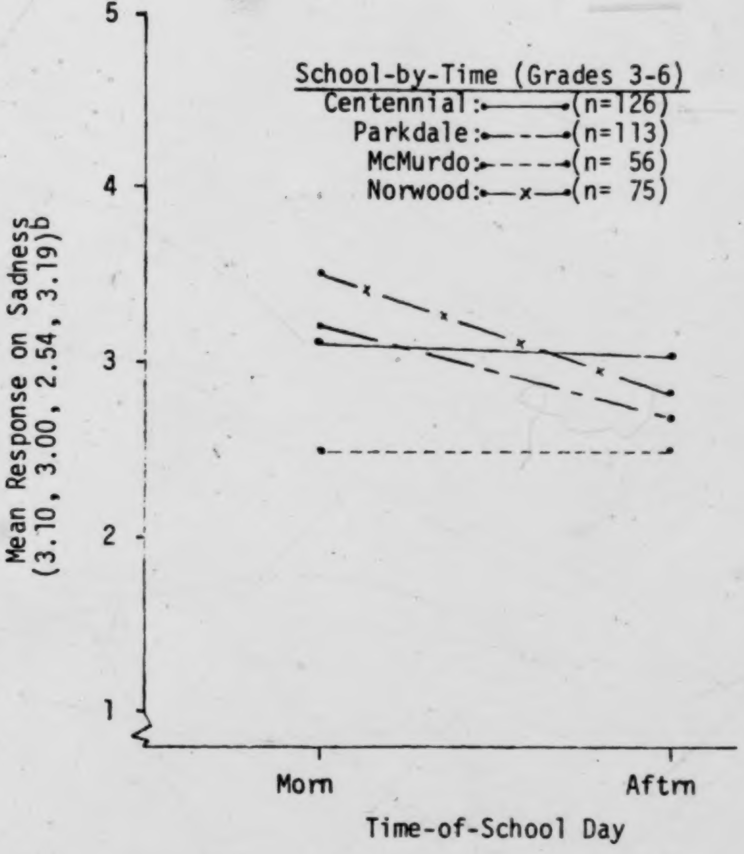
[a] Numbers in parentheses denote grand means for males & females, respectively--sig≤.001

[b] Numbers in parentheses denote grand means for grades 3, 4, 5, & 6, respectively

*sig≤.001
**sig≤.0001

Figure 19

Diurnal Variation on the Mood of Sadness: Schools[a]

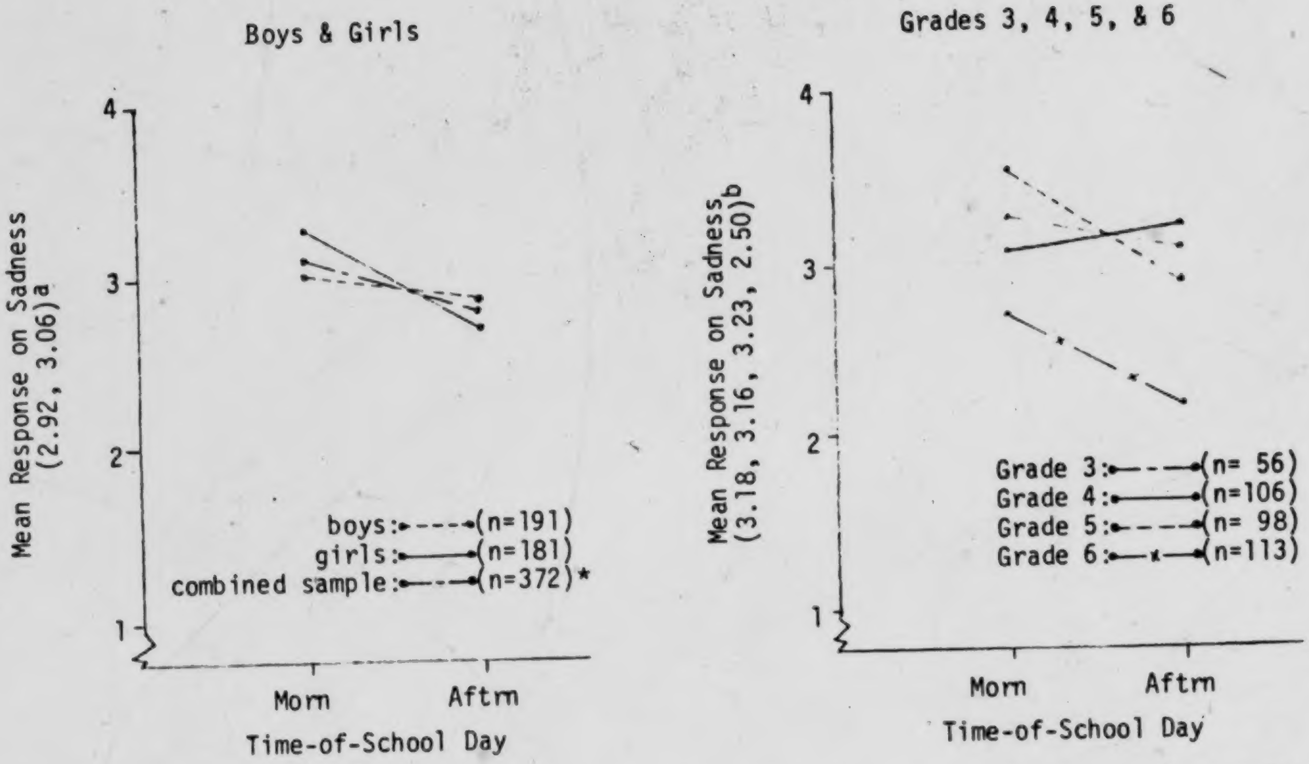


[a] Schools: Centennial = Control, Parkdale = Light change only, McMurdo = Color change only, Norwood = Light & color change

[b] Numbers in parentheses denote grand means for grades 3 - 6 at Centennial, Parkdale, McMurdo, and Norwood, respectively (no grade 3 at McMurdo)

Figure 20

Diurnal Variation on the Mood of Sadness: Wetaskiwin Sample



[a] Numbers in parentheses denote grand means for males & females, respectively

[b] Numbers in parentheses denote grand means for grades 3, 4, 5, & 6, respectively

*sig$\leq$.05

VII. DISCUSSION

Ruckmick, in 1936, stated that "in the description of moods we...have neither a long literature on the subject behind us...nor any experimental work of note" (p. 72). As was true almost half a century ago regarding the entire state area, so too is it true for the arena of childhood mood states. Moreover, personality theorists and researchers who have been paying considerable attention to the concept of adult mood, as defined through factor analysis, have appeared to almost totally ignore this topic in the child. Since such taxonomic endeavors have led to the consensus that mood plays a very integral part in the total functioning of personality (Wessman & Ricks, 1966), it seems especially unfortunate that this should be the case. The present effort, then, was directed towards investigating the long-neglected area of childhood mood states, and thus, in rectifying such a lacuna in the field of personality dynamics.

Royce (1950) maintained that the "proper order" for any research program consisted of three main steps: 1) Factor analyses should be conducted on the selected set of a priori measures in order to determine basic factor structure, as well as any other sources of variance which may be operating; 2) analyses of variance for each of these obtained factors should then be carried out as a means of determining situational and demographic affects; and 3) carefully-controlled laboratory experimentation may then be implimented with confidence, knowing full well that probable sources of error have already been determined.

Taking due cognizance of these research prescriptions, my investigative program into pre-adolescent mood states began with the determination of basic mood structure via exploratory factor analysis (Schokman-Gates, 1981). From the results obtained in this M.Sc. study, further specification of the factors was carried out through the development of four factor scales. Nevertheless, due to the fact that such scales are not the same as the underlying factors (Kim & Mueller, 1978a), additional analyses were required. These factoring programs involved the use of exploratory and confirmatory analyses in order to determine whether the measures did indeed represent the four basic pre-adolescent moods, and hence, possess adequate construct validity (Comrey, 1973). Lastly, empirical validation measures (criterion-related) were used in order to ascertain whether the mood scales were sensitive to both situational and demographic variables (Kelly, 1967); this aspect of the study entailed the use of analysis of variance and multiple comparisons.

From the research steps outlined above, it can be seen that both factor analytic and analysis of variance techniques were well-represented in this investigation; only the third prescription of controlled laboratory experimentation was not considered--and for good reason: The present research endeavor was never intended to be an "experimental thesis" in the most rigid sense of the term, since such results could not be claimed veridical until the measure under consideration had been validated; ergo, the division into construct and criterion-related sections, with the primary focus being upon test validation. Nonetheless,.the research designs employed allowed for the use of two quasi-experimental conditions, and thus results obtained from both the conceptual and empirical analyses of these two studies will now be discussed.

Returning then to the four research hypotheses of Chapter IV, those pertaining to construct validation will be dealt with first and in some detail with respect to the results obtained. Following these discussions, the criterion-related hypotheses will be presented, with further comments being made in regard to their veracity.

A. Construct Validation

Edmonton Sample

Construct Validation Hypothesis 1. The construct validity of the Pre-Adolescent Mood Scale will be supported by data gathered in the Edmonton sample, and by evidence provided by:

a) congruent exploratory factor analyses in both the exam and film conditions;

b) congruent confirmatory factor analyses in both the exam and film conditions;

c) dR-factor analysis confirming the presence of four independent mood scales;

d) congruent indices of factor invariance between the exam and film conditions; and

e) congruent indices of state dimensionality.

internal consistency, and reliability for both the exam and film conditions (Table 7.1 presents a summary of these data).

Hypotheses 1a and 1b:
Exploratory and confirmatory factor analyses

As noted in Chapter V, exploratory principal components analysis and principal axis factoring for both the exam and film conditions revealed the presence of only four factors: Surgency, Aggression, Mastery/Self-Esteem, and Sadness. Moreover, these results were obtained irrespective of rotational method used (orthogonal or oblique), thus indicating that the four purported mood factors were indeed independent of each other. Nonetheless, the relative order of factor salience was found to be different between the two conditions: As would be expected from my previous research (Schokman-Gates, 1981), the Surgency factor was first for both the exam and film treatments, however, Aggression appeared as the second most important mood dimension only for those in the exam condition; Mastery/Self-Esteem assumed this second position for the film analyses, with the Sadness factor appearing to be the least important in all eight of the factor solutions (PC and PA analyses, using both orthogonal and oblique rotations, for each condition). These results are in accord with Eysenck's proposal (please refer to Chapter IV) that the presence of equivalent dimensions, but altered factor salience, provides some evidence for both the construct validity (stable factor structure) and criterion-related validity (relative factor importance) of a measure. Nonetheless, there are several other important considerations to be taken into account when a measure's subscales comprise the totality of the factor structure. As was noted in the rationale chapter, a factor-analytically derived measure, if adequately developed, should present a factor solution which has only one scale per factor, based on high intra-factor loadings, and few, if any, cross-factor loadings. Factor solutions for both the exam and film data indicated that the **Pre-Adolescent Mood Scale** satisfied each of these conditions. Furthermore, factor-scale reliability as measured by coefficient theta also lent support for the internal homogeneity of each scale.

Notwithstanding the considerable amount of data in support of the PAMS, and because it is considered quite legitimate to combine exploratory and confirmatory factor analyses in a single study (Kim & Mueller, 1978a), it was thought prudent also to carry out several factor programs which relied on specification of the purported dimensions. Moreover, if the simple structure of each factor-based PAMS subscale was confirmed by such analyses, it would no longer be factor-based, but rather a legitimate factor scale (Kim & Mueller, 1978b).

In accord with the above view, then, both Rao's canconical (maximum likelihood) and alpha factor analyses were carried out, with results paralleling those found in the exploratory analyses. Thus, based on the data obtained from ten different factor analyses (eight exploratory, and two confirmatory), it appears as though confirmation has been obtained for Construct Hypotheses 1a and 1b. Nonetheless, such validation of the Pre-Adolescent Mood Scale only provides support for the measurment of a construct, it tells us nothing about the static (trait) or dynamic (state) nature of the construct. For my purposes, the latter consideration is also of equal importance, since the instrument is purported to be a measure of state processes. Hypotheses 1c, 1d, and 1e are directed towards this issue.

Hypotheses 1c and 1d:
State dimensionality and factor invariance

Loevinger (1957) maintained that construct validity could only be established by the convergence of several lines of evidence: 1) Through psychometric evidence, which provides support for the systematic nature of the construct; and 2) through psychological evidence, which provides support for the particular interpretation given to the construct.[1] In accord with this view, various factor analytic technqiues were employed in order to obtain both psychometric and psychological evidence. We have just discussed the results obtained by two such procedures--the exploratory and confirmatory factor analyses--in relation to Hypotheses 1a and 1b. The results of a third procedure, the differential R-technique, will now be considered.

The principal aim of differential R-technique is to "structure the multidimensional nature of change" (Nesselroade & Cable, 1974)--a necessary condition if the construct under consideration is purported to be one of state dimensionality. A perusal of the factor structures obtained for the dR-analysis, and for the separate exam and film analyses supports the assertion that the three sets of factor patterns are indeed the same, with relative ordering of the dimensions following that of the film (control) condition: Surgency is found to be the most salient mood factor, with Mastery/Self-Esteem, Aggression, and Sadness representing the second, third, and fourth state dimensions. Of particular note here, however, is the presence of four items which have inter-factor correlations, albeit they do have greater item-factor loadings on their respective dimensions. The Sadness items of upset and unwanted are found to negatively and separately load on the factors of Surgency and Aggression, respectively. Moreover, Aggression's mean item is seen on both the Mastery/Self-Esteem (positive loading) and Surgency (negative loading) factors, while its like hitting item is also a negative loader on the latter dimension. Only one variable of the Pre-Adolescent Mood Scale is found to not be a marker in this dR-analysis--that of handsome (or) pretty from the Mastery/Self-Esteem subscale --the one item which also cross-loaded in the exam and film analyses. Perhaps these four items, which usually appear as positive contributors to their respective factors (when taken on single-occasion samples), are actually both positive and negative mood markers. only further research, using the dR-technique, will be able to provide the answer, and hence, we will return to this issue when the Wetaskiwin data is discussed.

In a similar vein, attention will now be focussed upon the two analyses used to confirm the presence of factor invariance in the Edmonton data. The problem of factor invariance is concerned with the extent to which the dimensions remain stable through alterations in the composition of the subject sample, the test battery, or the testing conditions. For this investigation, only the first and last considerations were of interest, with the latter one being of most current concern.

Alterations in the testing condition--exam vs film treatment--were found to produce factor matrices which attained congruence levels of greater than .98 on each of the four PAMS dimensions. Such values are very good indeed when you consider that a reasonable level of factor congruence may be claimed with coefficients as low as .80 (see Section B of Chapter IV). Moreover, the minimal amount of rotation necessary in order to compare these two structures, indicates that these factor patterns were stable and robust. Hence, further confirmation is provided for the construct validity of the Pre-Adolescent Mood Scale.

As mentioned previously (see note 1 for this chapter), psychometric evidence for the presence of construct validity may be provided by one of several means--for example, by looking at the amount of congruence between factors purported, as well as by looking at the actual item characteristics of the intended measure. Since we have just spoken to the first issue, it is to this second line of evidence that we will now turn.

Hypothesis 1e:

State dimensionality and scale-item characteristics

The within-scale interitem correlations obtained for both the exam and film conditions were found to be very significant indeed, when you consider the usual criterion accepted for such measures of scale homogeneity (0.2-0.3 as noted by Zuckerman, 1979). In these data, the coefficients ranged from a low of .2463 for Sadness 1 and 3 in the exam condition, to a high of .7356 for Surgency 1 and 3. The film condition provided similar coefficients, while the average within-factor item correlations for the exam and film data were .4819 and .4532, respectively. Furthermore, factor scale-item correlations revealed coefficients of not less than .5766 (for Mastery/Self-Esteem 2 and its scale-total in the film analysis), with the majority being in the .7500 - .8300 range. Thus, from these results, it would appear that the four PAMS scales are each internally-homogeneous. Nonetheless, such information does not provide assurance that the factor-scales are indeed reliable. For that evidence, I had to employ specific techniques based on item-total statistics (e.g., coefficient alpha).

From a perusal of the exam and film data, it can be seen that each of the factor scales attained very respectable alpha levels, irrespective of the testing condition involved. Moreover, all of the PAMS mood items were found to contribute to their respective scale's alpha value, save one--that of handsome (or) pretty from the film condition's Mastery/Self-Esteem scale. Considering that this item had also been a weak one in some of the factor analyses previously discussed, it was not too surprising to find it as a "detractor" in this analysis. Nonetheless, due to the specific reason for inclusion of this variable (please refer to the Item Selection section of Chapter III), as well as the counsel provided by Thorndike regarding items having an "intermediate level of internal consistency",[2] it was decided that the very small amount of detraction (alpha went from .84 to .81) was inconsequential when content of the Mastery/Self-Esteem scale was taken as a whole.

The final set of conceptual validation results to be discussed in regard to the Edmonton sample is that concerning the differentiation of state from trait measures. As was noted in the previous discussion concerning the dR-technique, because the Pre-Adolescent Mood Scale is intended to be a state measure, several lines of evidence are necessary in order to actually put forth such a claim. The dR-factor analysis provided one of these lines of support by indicating that the factor scales were indeed robust, and yet, systematically sensitive to the different mood-effects produced by the exam and film conditions. Another line of evidence entails the use of internal consistency measures (Cronbach's alpha in this case) and test-retest reliabilities, in order to derive an index for specifying the static (trait) or dynamic (state) nature of the construct (Howarth, 1978). The values obtained for this U index confirm that the first three PAMS subscales--Surgency, Sadness, and Aggression--clearly fall within the limits given for a state measure. On the other hand, the Mastery/Self-Esteem factor appears to be tapping a more static construct, as evidenced by the fairly high test-retest values. Once more, it seems as though there may be a problem with either some item(s) on the **Mastery/Self-Esteem** subscale or with the construct itself, for if this factor were indicative of a mood state, much lower test-retest coefficients should be obtained. Nonetheless, no definite conclusion may be made regarding this issue until further data--based on different types of analyses, and even a different population sample--is presented. Therefore, it is to the second construct validation hypothesis that we now turn.

Wetaskiwin Sample

Construct Validation Hypothesis 2. The construct validity of the **Pre-Adolescent Mood Scale** will be supported by data gathered in the Wetaskiwin sample, and by evidence provided by:

a) congruent exploratory factor analyses in both the morning and afternoon conditions;

b) congruent confirmatory factor analyses in both the morning and afternoon conditions;

c) dR-factor analysis confirming the presence of four mood scales;

d) congruent indices of factor invariance between the morning and afternoon conditions, and between those conditions and the exam and film treatments of the Edmonton sample; and

e) congruent indices of state dimensionality, internal consistency, and reliability for both the morning and afternoon conditions (Table 7.2 presents a summary of these data).

Since a primary goal of this research endeavor was to provide evidence for the validity, and hence generalizability, of the Pre-Adolescent Mood Scale, the following section will focus not only on the results obtained for the Wetaskiwin sample, but also on how these data may relate to those found for the Edmonton sample.

Hypotheses 2a and 2b:

Exploratory and confirmatory factor analyses

In line with the findings of the Edmonton study, factor analyses on the Wetaskiwin data confirmed the presence of four orthogonal dimensions. Nonetheless, the Edmonton analyses did differ from those of the Wetaskiwin sample in at least two respects: 1) Relative ordering of factor importance, and 2) the number and nature of the cross-loading variables.

In reference to the first consideration, as will be remembered from the previous discussion, the exam and film conditions produced an alteration in the relative importance of the Aggression and Mastery/ Self-Esteem factors; Aggression was found to be more salient for children just prior to an exam, while Mastery/Self-Esteem was more salient just prior to a film. In the Wetaskiwin data, however, no such alteration was found for any of the dimensions in either the morning or afternoon analyses: Surgency maintained the supreme position (as it also had in the Edmonton analyses), with Mastery/Self-Esteem and Aggression following in that order; the Sadness factor once more was at the nadir. Furthermore, this pattern of factor salience was the same as that presented by the film (control) treatment of the first study, suggesting that perhaps this order is the usual "hierarchy-of-moods" within pre-adolescents: Neither the morning nor afternoon conditions were "manipulative", but rather only concerned with diurnal effects on mood, while the film condition was also essentially a control (as explained in Chapter IV); only the exam treatment involved any expected-direction of mood alteration, with the hypothesis put forth that this "apprehensive activity" would produce a greater increase in negative mood states. And, based on the comparisons of the four factor structures, such an hypothesis was supported, as evidenced by the altered mood-factor salience found only in the exam data. Thus, it appears as though the constructs being tapped by the Pre-Adolescent Mood Scale are differentially sensitive to environmental conditions.

In regard to consideration two above--the number and nature of the cross-loading variables--the Edmonton study produced only two "aberrant" markers, while the Wetaskiwin data revealed a total of six when the morning and afternoon data were taken together: The Edmonton exam condition saw two Mastery/Self-Esteem items (brave and handsome/pretty) also load on Surgency, while the film treatment found only one of these variables (handsome/pretty) as a cross-loader. On the other hand, the morning Wetaskiwin condition revealed two Sadness items (trapped and unwanted) as being cross-loaders on Aggression, with the afternoon analysis producing the most unusual pattern of "other factor" loadings: Upset from the Sadness scale and bad-tempered and mean from the Aggression scale were all found to be negative correlates with the Surgency dimension, while furious of the Aggression factor was also loaded by that of Sadness. Nonetheless, out of the nine PAMS items just discussed, all of them, save one, maintained considerably higher loadings on their appropriate dimensions. The one exception was trapped, from the morning Wetaskiwin data, where it appeared as a stronger marker for Aggression than it did for Sadness, albeit this item also had a considerable loading on the latter factor. It appears in these instances, then, that although the mood dimensions themselves are unrelated (orthogonal), there may be several mood items which are differentially affected by the presenting event, and thus are differentially related to at least one of the other-state factors. Discussion, however, as to whether or not this poses a problem for the PAMS, must await further evidence regarding the scale-item characteristics; such information will be presented when Construct Validation Hypothesis 2e is considered.

Returning now to the issue of mood structure via factor analysis, factor-scale reliability in the Wetaskiwin sample, was found to parallel that of the Edmonton data. Theta coefficients for the morning and afternoon conditions were found to be .832 and .885, respectively, with the Edmonton conditions producing an exam-theta of .867 and a film-theta of .844. Clearly, these data provide evidence for the presence of four very robust and internally-consistent factor scales. Nevertheless, since the Wetaskiwin scales were based on exploratory factor analyses, attention must also be accorded the structures obtained through confirmatory factor analyses.

As was found for both of the Edmonton conditions, maximum likelihood (Rao's canonical) and alpha factoring confirmed the existence of four factors in the Wetaskiwin data. It is interesting to note, however, that when unspecified[3] confirmatory analyses were run on the afternoon condition, the orthogonal factor scales of Surgency and Aggression were found to collapse into one bi-polar dimension. This was the first and only time that any of these pre-adolescent mood factors had assumed bi-polarity. Moreover, several of the Aggression items (furious and like hitting) were also found to share positive loadings with the Sadness factor as structured by Rao's solution, thus indicating that the afternoon Aggression dimension no longer maintained its integrity, but rather had differentially contributed to both negative

(Sadness) and positive (Surgency) mood states. This result is especially interesting in view of the fact that the exploratory analyses on the afternoon condition found Aggression to be a fairly robust uni-polar dimension, with Sadness being the weaker factor. Perhaps closure may be brought to these rather contradictory findings by looking at three separate issues: 1) As Lorr and Shea (1979) discovered, depending on the state construct and subject-condition under investigation, it appears as though "some moods are bi-polar while others are not...[since] semantic opposites need not be psychological opposites" (p.471-472); 2) the different assumptions[4] upon which the two confirmatory and one exploratory factor techniques operate may produce slightly different factor structures; and 3) the use of confirmatory factor analysis implies that specification as to the number and nature of the expected factors will be made before hand, with analyses then being carried out under those exacting conditions. When that was done with the afternoon Wetaskiwin data, confirmation was provided for each of the four PAMS factor scales. And thus, Construct Validation Hypotheses 1a,b and 2a,b appear to have been very adequately supported by the above data analyses.

Hypotheses 2c and 2d:
State dimensionality and factor invariance

A perusal of the factor structures obtained for the Wetaskiwin dR-analysis and the morning and afternoon analyses, indicated that the three factor patterns were indeed the same, with the relative ordering of the dimensions also remaining the same: Surgency was found to be the most salient state dimension, followed by the mood factors of Mastery/Self-Esteem, Aggression, and Sadness. As will be remembered from the previous discussion, this was the same order of mood-state importance as that found in the film analyses and in the Edmonton dR-factoring. Nonetheless, fewer cross-loading variables were discovered for the Wetaskiwin differential R-analysis, with one Sadness (upset) and one Aggression (bad-tempered) item found to be negatively-loaded by Surgency. As may be recalled, these two variables were cross-loaded on the afternoon Surgency dimension, while upset also revealed a negative relationship to Edmonton's dR Surgency factor; bad-tempered confined its cross-loadings strictly to the Wetaskiwin data. Coefficient theta for this dR-analysis was found to be .841, in comparison with the .827 attained by the Edmonton sample, thus indicating that the PAMS state factor scales for both the first and second studies were indeed robust and internally-reliable.

Turning now to the actual factor-structure comparisons for both the Wetaskiwin and Edmonton conditions, highly significant ($p<.001$) Tucker congruence coefficients were obtained for each of the four PAMS scales. These results indicate that even though four different conditions were involved, using two different population-bases, the factor structure of the PAMS measure remained invariant. What is especially interesting in these results, however, is that despite the different sample groups used, the most congruent of the factor structures were those found for the afternoon Wetaskiwin data and the Edmonton exam data. It appears as though these two conditions had more in-common influence on mood states than did the same subjects being compared from morning to afternoon, and about an equal amount of influence as did the same subjects when compared on exam and film conditions. Nevertheless, due to the extremely-high significance levels for all of the factor comparisons, it is not possible to tease-out just what the influence would be, hence, we will leave this issue to be broached in the criterion-related validation section to follow.

Hypothesis 2e:

State dimensionality and scale-item characteristics

In regard to the PAMS subscale-homogeneity, data from the two Wetaskiwin conditions indicated that all 40 of the factor scale-item correlations attained very respectable values ($p<.001$). These results are in line with those found for the two Edmonton treatments, although for those analyses, the Sadness scale had the two lowest mean correlations (.6830 for exam and .6904 for film). In the Wetaskiwin data, on the other hand, the Aggression subscale provided the lowest value for the morning condition (.6717), while Sadness, once more, reached the nadir in the afternoon data (.7218); as has been the case all along, the Surgency factor attained the highest factor scale-item correlations in all four of the analyses (.7897 - .8388).

Along a similar line, the within-scale interitem correlations for the Wetaskiwin morning and afternoon conditions, provide evidence for the significant relationship of each mood marker to its factor cohorts. Coefficients for the afternoon data ranged from a low of .2439 for Sadness 2 and 3, to a high of .7658 for Surgency 1 and 3. The morning data provided similar coefficients, while the average within-factor item correlations for the afternoon and morning analyses were .5272 and .4370, respectively. These values are in comparison with those obtained for the Edmonton sample, where the exam condition produced a mean r of .4819 and the film condition gave one of .4532. Moreover, Surgency 1 (cheerful) and 3 (joyful) were found to consistently have the greatest correlation in all four of the analyses, while Sadness 3 (trapped) was involved in all four of the lowest correlations. Needless to say, however, each of the 80 within-scale interitem correlations were significant at $p<.001$. Thus, from the data provided by the four Edmonton and Wetaskiwin conditions, it would appear that the PAMS state scales are each robust and internally-homogeneous.

Turning now to evidence regarding their reliability, alpha coefficients for the subscales, assessed during the morning and afternoon Wetaskiwin conditions, revealed that each of the PAMS scales attained very respectable alpha levels, irrespective of the time-of-day involved. And, as was found in the Edmonton data, all of the mood items, save one, contributed to an increase in their scales' degree of reliability; hence, each was believed necessary in order to properly-define its respective factor. The one aberrant item was **handsome (or) pretty** from the **Mastery/Self-Esteem** subscale. This item had shown itself in the previous analyses to either be totally innocuous (e.g., the Edmonton exam condition), or to even have a slight detracting influence. Nonetheless, because the detracting influence was so slight (see note 2 at the end of this chapter), and because this item is believed to be tapping an important aspect of self-esteem (please see Selection of Items in Chapter III), there is no firm evidence to indicate that this, or any of the other items, should be deleted or revised. Moreover, evidence provided by the criterion-related analyses support the assertion that each of the PAMS items is significantly affected by situational and environmental contingencies.

Turning now to the final set of construct validity results, discussion will be directed to the differentiation of state and trait measures in relation to the PAMS subscales. As was found for the Edmonton sample, the Surgency and Aggression factor scales attained

U values which indicated that they fell well within the range recommended for state instruments. On the other hand, neither the **Sadness** nor **Mastery/ Self-Esteem** subscales reached such levels in the Wetaskiwin data; for the latter scale of **Mastery/ Self-Esteem**, this was expected, since it was also a "poor-U shower" in the Edmonton sample, but the Sadness subscale had definitely been designated a state measure in that analysis. The problem appears to lie in the fact that for the Wetaskiwin conditions, the test-retest coefficient was considerably higher, therefore, it brought down the value obtained for U. Perhaps because the **Pre-Adolescent Mood Scale** was given twice within the same day and with no manipulation of conditions being attempted (as oppossed to the different days and manipulated conditions of the Edmonton study) the state of **Sadness** within these children did not differ much from morning to afternoon. Such a result parallels that found in the adult literature (e.g., Wessman & Ricks, 1966), where although there definitely appears to be a sadness dimension, it is not believed to be much in operation during normal mundane events--it is only when some unexpected or undesireable occurrence is involved that this dimension is seen to make a grand appearance.[5] Thus, with the Edmonton conditions of mood measurement just prior to an exam vs just prior to a film, one would expect such an appearance, and the test-retest correlations support this. Nonetheless, further evidence of an empirical nature is needed in order to place a strong degree of trust in these assertions. Therefore, it is to a discussion of the criterion-related hypotheses advanced in Chapter IV and the results obtained in Chapter VI that we will now turn.

B. Criterion-Related Validation

As Comrey noted, "the goal [of factor analysis in test construction] is to develop a highly reliable instrument that provides as pure a measure as possible of the construct in question" (1973, p.245); the above data provides evidence that the Pre-Adolescent Mood Scale is just such a measure. In order to employ this instrument with full confidence, however, another line of evidence must also be pursued--that relating to analysis of variance. For, due to the fact that the anova methodology is "essentially a link between the classical single variable [experimental] design and the multivariate factor analytic design" (Royce, 1967, p.318)[6] its use is considered efficacious in determining how the independent variables will affect the factor analytically-derived dependent variables. Accordingly, the results obtained using this technique will now be discussed in relation to the two criterion-related hypotheses advanced in Chapter IV.

Edmonton Sample

Criterion-Related Validation Hypothesis 1. The criterion-related validity of the Pre-Adolescent Mood Scale will be supported by data gathered in the Edmonton sample, and by evidence provided by:

a) differential mood-effects found for the exam and film conditions;

b) differential mood-effects found for the gender variables;

c) differential mood-effects found for the age (grade) variables; and

d) differential mood-effects found for the time-of-day variables (Table 7.3 presents a summary of these data).

Hypothesis 1a: Exam and film mood-effects

Variance analyses undertaken on the exam and film data suggested that each condition produced highly significant differential mood-effects, as measured by both the individual PAMS items and its four subscales.

When compared to the film data, those obtained for the exam condition revealed significant reductions in the positive mood factors of Surgency and Mastery/Self-Esteem, along with a significant increase in the negative Aggression factor; Sadness also entered into the analysis, but it was found significant only for the youngest (grade 3) and oldest (grade 6) children in the exam condition.

A breakdown of the PAMS subscales into their component parts revealed that all five of the Surgency items were significantly affected by the treatments, and in the expected direction: The children indicated that they felt significantly less cheerful, glad, joyful, and wonderful in the exam condition, and that they felt less like smiling during that time than they did during the film condition. Moreover, feelings of physical attractiveness (handsome/pretty) were found to significantly decrease in the exam data, as did the children's scores on feeling powerful, strong, and tough--all mood items related to the Mastery/Self-Esteem factor. On the other hand, two Aggression items revealed their greatest increase to be in this exam condition, with feelings of being furious and bad-tempered reaching significant elevations.

Lastly, on the Sadness scale, only one item was found to be affected by the classroom conditions--that of feeling lonely. It, however, was in the opposite direction of that expected, with third- and fifth-grade boys in the film treatment evincing an increase. Perhaps the boredom that might accompany this "neutral activity"--as well as the necessary enforced-silence of a movie--would lead these usually energetic youngsters to feel more lonely and isolated in the film treatment.

It is apparent from these above data that the Pre-Adolescent Mood Scale was sensitive to treatment conditions, with the positive mood states of Surgency and Mastery/Self-Esteem evincing reduced levels prior to an exam, and the negative Aggression state showing an elevation; the second negative mood scale, that of Sadness, revealed an elevation also, but it was in interaction with the age variable. This latter result is totally in line with those I obtained in the initial investigation of childhood mood states (Schokman-Gates, 1981), for I found that "neither gender nor age alone would have sufficed in determining the mood structure of pre-adolescents. Both must be considered as independent variables when determining this structure, since each brings its own unique patterns of mood to the analysis" (p.86). And thus, it appears so in these analyses too.

Hypotheses 1b and 1c:

Gender and age (grade) mood-effects

Variance analyses undertaken on the four PAMS subscales and their individual items indicated that each of the independent variables (sex and grade) produced highly significant differential mood-effects: Females and grade 3 subjects scored significantly higher on the Surgency subscale, while these same two groups, along with grade 4 students, also scored significantly lower on the Aggression dimension. Moreover, the youngest sample (grade 3) was found to share its significantly elevated Mastery/Self-Esteem scores with those of the male sample. The Sadness dimension had elevations on the exam condition for females, but a reversal of this pattern in the film data washed-out any possible significances.

In regard to the most salient mood items, females and grade 3 students felt significantly more cheerful glad, joyful, and like smiling, than did their gender or age counterparts, with the youngest group also feeling significantly more wonderful. On the other hand, males and grade 5 and 6 students were found to have considerably elevated score on like hitting, while the males also showed significances on feeling bad-tempered, bossy, and mean; the final Aggression mood descriptor, furious, was found to be significantly elevated for the intermediate age group (grades 4 and 5) only.

A perusual of the Mastery/Self-Esteem data indicated that males and grade 3 subjects scored significantly higher than did their cohorts on the feelings of being brave, powerful, and tough, with a steady decline in mean scores for these variables being noted as age increased. Additionally, males reached significant elevations on the strong mood item.

The Sadness subscale was most affected by age differences: Trapped appeared to have the greatest salience for children in the youngest and oldest groups (grades 3 and 6), while unwanted was the most significant mood item for the third-graders; this state descriptor was also found to be the most "age influenced", in that its value was seen to decrease as age of the child increased.

These results parallel those found in my Master's research (Schokman-Gates, 1981), and thus appear to be fairly indicative of both developmental trends and gender differences in childhood mood states. Nonetheless, because both these data and those of the earlier investigation were taken from the same population base (Edmonton Public School System), no definite conclusions may be drawn. Any such assertions must await further evidence provided by the Wetaskiwin sample, which will be presented after the diurnal variation discussion which follows.

Hypothesis 1d: Diurnal variation mood-effects

Analyses of variance for time-on-exam and time-on-film gave significant results for all four of the PAMS subscales: Surgency scores were found to be at their lowest level during the two mid-day exam conditions, while they attained their highest at the mid-morning film condition. Aggression, on the other hand, revealed almost a parallel increase in scores over the course of the day, nonetheless, the film condition produced significantly lower scores on this factor.

Diurnal analyses on the Mastery/Self-Esteem dimension revealed a sharp drop in positive-self feelings when an exam was scheduled for right after lunch; conversely, this post-prandial time was the most positive for those in the film group. The Sadness subscale appeared to be the one least affected by a time-on-condition influence, since both the exam and film treatments followed the same trend of lower morning- and higher afternoon-Sadness. Notwithstanding this result, the afternoon-exam condition did reveal a significant inflation in the children's depressive feelings, as measured by the PAMS.

In regard to time-on-gender, males and females revealed significantly greater degrees of positive mood state (Surgency) at the beginning of the day, while negative states (Aggression and Sadness) became more dominant as the day progressed. The Mastery/Self-Esteem scale, on the other hand, did not present such a concise descriptive pattern regarding its diurnal affects, for it appears as though the actual testing condition, in interaction with gender, overrode whatever influence time-of-day may have had: Females in the film condition increased in their positive-self feelings from morning to afternoon, while the males in that condition, as well as both genders in the exam condition, decreased over the course of the school day. These results follow closely those found in my M.Sc. thesis (Schokman-Gates, 1981), and thus appear to substantiate the purported influence of diurnal variation on state factors.

Turning now to the effects of time-on-age, no significant trends were found for the Surgency subscale, although there was a tendency for this dimension to decrease from morning to afternoon. The Mastery/Self-Esteem scale was similarly affected, with no significant trend being found, but its tendency across grades was to increase from the beginning of the school day to the end. The Aggression and Sadness state scales gave much more consistent data regarding diurnal variation, with almost all of the grade analyses indicating increases in these negative moods over the course of a day.

Thus, it appears from these data that time-of-day may very well indeed have a strong influence on one's level of mood states, nonetheless, the greatest influence may be seen to obtain from a combination of individual (age and sex) and situational (condition and time-of-day) factors. In order to place great credence in this assertion, however, further evidence must be provided. Therefore, it is to a discussion of the criterion-related validation results of the Wetaskiwin study that we now turn.

Wetaskiwin Sample

Criterion-Related Validation Hyphesis 2. The criterion-related validity of the Pre-Adolescent Mood Scale will be supported by data gathered in the Wetaskiwin sample, and by evidence provided by:

a) differential mood-effects found for the school color/light vs control condition;

b) differential mood-effects found for the gender variables;

c) differential mood-effects found for the age (grade) variables; and

d) differential mood-effects found for the time-of-day variables (Table 7.4 presents a summary of these data).

Hypothesis 2a:

School color/light vs control mood-effects

Variance analyses undertaken on the Wetaskiwin data suggested that highly significant mood-effects were produced by the four schools under consideration, thus supporting the assertion that mood-altering conditions were present within these environments. Furthermore, since this part of my investigation was actually an adjunct to the main Wetaskiwin study, it was quite gratifying to discover significant results on all four of the mood scales, and on many of the individual items. Nevertheless, due to the abundant amount of significant data, and the apparent lack of any other child mood-environment studies to compare this with, discussion of these results will have to remain in more general terms. Thus, in general (over the course of the school day), students in the light-altered environments (Norwood and Parkdale) were found to have greater feelings of **Surgency** and **Mastery/Self-Esteem**, with lowered feelings of **Sadness**, compared to those students in the control school. On the other hand, children in the color-altered conditions (McMurdo, as well as Norwood which had color and light alteration), were significantly different from the control group only on the measures of **Surgency**-over-time and afternoon-**Sadness**; in fact, McMurdo, the one school whose sole change was its color, actually had the lowest level of **Mastery/ Self-Esteem** out of the four groups.

As far as the mood scale of **Aggression** went, there were significant differences between the control group and two of the three experimental groups: Centennial students scored significantly higher on **Aggression** than did those in the light-altered (Parkdale) and color-altered (McMurdo) environments;

surprisingly though, so did the children at the light- and color-altered environment (Norwood). A summary of these environmental mood effects over time (from morning to afternoon testing) is provided in Table 7.5.

In reference to the specific discriminating mood-variables, the majority of significant results were associated with the school-by-time measure: All five **Surgency** items fell into this category, with the three experimental schools usually increasing their scores from morning to afternoon, while the control decreased. Similar results were found for the **Mastery/Self-Esteem** scale, where again, each of the five state-descriptors was involved in producing significant differences--this time, however, the beneficial differences accrued to the two light-altered schools (Norwood and Parkdale).

The significantly-discriminating mood items associated with the **Aggression** factor once more comprised the entire scale, with increases-over-time being very robust for all schools save McMurdo (color-altered only); students in this school actually decreased in their feelings of being **bad-tempered**. As to the Sadness dimension, two items attained significance levels of at least .04; the three experimental schools revealed a decrease in the sad descriptor over the course of the day, while the color- and light-altered school (Norwood) was also significantly less upset by day's end.

Taken as a whole then, it appears that the most robust and beneficial mood-altering environments (considered as "effects over the day") were present at Norwood and Parkdale schools. The one environmental factor which these two buildings had in common was the use of full-spectrum, as opposed to fluorescent lighting. Nonetheless, since other physical characteristics were not controlled for at Parkdale or McMurdo, it would be improper to infer that lighting alone was responsible for the obtained mood results. Rather, due to the great number of differences found between Centennial (control) and Norwood (light and color), which were controlled for physical characteristics, one may feel confident only in stating the following: The environmental conditions present at Norwood Elementary School on the day of testing, were found to be significantly more conducive to increasing the students' positive mood states over the course of the day than were those conditions present at Centennial Elementary School.

Hypotheses 2b and 2c:

Gender and age (grade) mood-effects

Variance analyses undertaken on the four PAMS subscales and their individual items indicated that each of the independent variables (sex and grade) produced highly significant differential mood-effects. As was found in the Edmonton sample, females and younger children (in this case, grades 3 and 4) were seen to score significantly higher on the **Surgency** factor, with females also scoring significantly lower on the **Aggression** and **Mastery/Self-Esteem** subscales. Unlike the Edmonton sample, however, grade 3 and 4 students in Wetaskiwin actually had greater **Aggression** scores than did the older students, with their afternoon values being the highest attained for any of the groups in either the urban or rural setting.

The **Sadness** dimension was found to be most influenced by a gender-by-time interaction, with females attaining higher morning scores, along with lower afternoon values. This pattern was also found for all of the age groups, save that of grade 4, which increased in its depressive feelings during the afternoon; it appears then, that only this Wetaskiwin intermediate-age group was similar to the Edmonton sample as far as the diurnal affects on **Sadness** were concerned.

In regard to the most salient mood variables for the various grades and sexes, females in Wetaskiwin were very similar to their Edmonton counterparts, with significant elevations found on the **Surgency** items of being **cheerful**, **glad**, and **joyful**, and feeling more **like smiling**. Moreover, two items--**joyful** and **like smiling**--saw a grade-by-time interaction, with the younger students (grades 3 and 4) attaining higher morning values, and the older children (grades 5 and 6) attaining the increased afternoon values.

In a similar vein, the Wetaskiwin males were in line with their Edmonton cohorts as far as the **Aggression** items were concerned, with all five of these mood-descriptors being significantly related to gender. The only **Aggression** item that was also a main-effect for grade was **furious**, which attained significantly higher values in the two lower grades (third and fourth); this is in partial contrast to the Edmonton data, where this state-descriptor was seen to be most salient for those in the fourth and fifth grades.

As was found for the urban children, the **Mastery/Self-Esteem** items appeared to be most important for the Wetaskiwin males, with significantly elevated levels being shown for all five of these state-descriptors. Nonetheless, no consistent age-affect was found for these data, since grades 4 and 5 revealed significantly higher **brave** feelings, while the physical attractiveness component of this scale (**handsome/ pretty**) was most salient for fifth graders; this is in contrast to the very strong effects found for grade 3 students in Edmonton.

The two significant **Sadness** discriminators for the Wetaskiwin sample involved items which were not salient for the Edmonton children when the analyses were concerned with age or sex differences. The feeling of being **sad** involved a sex-by-grade interaction, with grade four girls having the highest value, followed by grade five boys; for the other age groups, the females always attained higher scores on this variable than did the males. The **lonely** feeling was found to be especially important to third graders and fifth graders in the morning, while it attained a greater significance for fourth grade students in the afternoon. As may be remembered from the previous film-condition discussion, this **lonely** descriptor was also most important to third and fifth graders in Edmonton, however, only the males were affected in that analysis. Perhaps the film was a control condition, just as the morning testing was believed to be, thereby suggesting that grade 3 and grade 5 children may actually possess a "normally" higher sense of feeling lonely.

Hypothesis 2d: Diurnal variation mood-effects

Analyses of variance for diurnal affects on the four PAMS subscales produced significant results for the school conditions, as well as for gender and grade: Surgency scores were seen to rise over the course of the day for all schools save the control, where this factor was actually found to decline. Such results are in contrast to the Edmonton data, where this mood factor was found to decrease as time went by.

Aggression and Mastery/Self-Esteem also revealed scale elevations from morning to afternoon, however, this time all schools evinced a similar pattern. Only the Sadness scores provided by the Wetaskiwin data belied a general diurnal increase in mood states, since each of the four schools either became less "sad" or remained exactly the same. This result is in great contrast to that found for the Edmonton data, where the **Sadness** dimension revealed significantly elevated levels by day's end. In fact, out of the eight diurnal analyses on condition-effects, Edmonton and Wetaskiwin were only found to be similar in two--those pertaining to increased **Aggression** over the course of the day. Perhaps the differences between the urban and rural results could be explained in reference to the "beneficial evironments" provided by the three Wetaskiwin experimental schools, which were absent for both the Wetaskiwin control and all of the Edmonton schools.

In regard to time-on-gender, females revealed significantly greater degrees of **Surgency** at day's end than did the males, with the boys actually evincing a slight decrease from their morning scores. On the other hand, each gender's **Aggression** and **Mastery/ Self-Esteem** subscales were found to increase in value over the course of the day. Conversely, the **Sadness** mood factor was seen to decline in salience for both sexes by the afternoon testing.

Turning now to the effects of time-on-age, significant interactions were found for the **Surgency** subscale, with younger children (grades 3 and 4) evincing a decline, and older children (grades 5 and 6) showing an increase over the course of the school day. Similar findings were seen in the **Mastery/Self-Esteem** data, but here, the only age group to decline over time was grade 3. They, however, were significantly different from the other three grades in morning mood level, having by far the highest **Mastery/Self-Esteem** score.

As has been consistently found with the **Aggresion** subscale, diurnal affects appear to be an influence in this mood's salience from morning to afternoon. Nonetheless, what is of interest here is the change of **relative** importance, based on age. For, the third grade students went from being the least "aggressive" in the morning, to the most "aggressive" by day's end. When this is looked at in conjunction with the results for the two positive mood scales--**Surgency** and **Mastery/Self-Esteem**--it appears as though the Wetaskiwin third graders were the children most affected by time-of-day variables. This is in contrast to the Edmonton fourth graders who appeared to be the urban sample's most time-dependent group. Nevertheless, when it came to the diurnal affects found for the rural **Sadness** scale, it was also the fourth grade children who deviated the most from the Wetaskiwin norm of decreased scores over the day; these students were seen to actually have greater afternoon feelings of Sadness than they had started with in the morning. Clearly, diurnal mood-effects must not be taken in isolation; their influence should be acknowledged, and such variables should be included as important covariates when investigating childhood mood states. More attention will be accorded this issue in the implications chapter to follow.

Turning now to a summary statement based on the construct and criterion-related validation hypotheses discussed above, it appears as though their confirmation has been achieved: The Pre-Adolescent Mood Scale is a valid and internally-reliable state measure, which has been found to have great utility for assessing the mood-effects induced by both situational and environmental contingencies.

Notes for Chapter VII

1. The psychometric evidence would include such measures as degree of internal item-structure (homogeneity indices) and magnitude and stability of external relations (correlational data and factor invariance), while the psychological evidence is more related to the interpretation of item content and structure (factor naming and dR-analysis) and the nature of external relations (analysis of variance techniques).

2. Thorndike maintained that internal consistency data were most useful in helping weed-out the definitely unsatisfactory items, rather than in highlighting the most satisfactory, since "tests made up of items with intermediate internal consistency values have very nearly the same reliability as tests made up of items with the highest internal cxonsistency. It is only when items in the lower ranges of internal consistency are used that reliability of the resulting test suffers" (1967, p. 215).

3. These analyses were unspecified in the sense that no exact number or nature of the expected dimensions were included in the programs prior to their running. By not providing such information, then, I was actually

using these analyses in both a confirmatory and exploratory fashion; for if unspecified alpha and Rao's factoring produced the same results as did principal components analysis, there would be no need to provide any direct specification--and this was the case for all six of the previous analyses (Edmonton's exam and film, and Wetaskiwin's morning-alpha and Rao's factoring).

4. The guiding principle of Rao's canonical factoring is to maximize the correlations between the hypothesized factors and the set of data variables, with the assumption being made that the given r matrix is based on a sample of cases, and the intent is to estimate what the population parameters would be. Because some sampling errors are expected to exist, the resultant factor structure is not assumed to exactly fit the data. In alpha factoring, however, it is the variables which are considered to be a sample, with the cases being viewed as a given population. The specific intent of this analysis is to define only those factors which have maximum generalizabiltiy (Cronbach's alpha) as inferred from the sample variables. Finally, as noted before, PC analysis depends on exact mathematical transformations of the

input data, with no assumption being made about the general structure of the variables, or the cases being used; hence, its use for exploratory analysis.

5. Further evidence that this may be the case comes from the child domain, where the mood dimensions of happiness and sadness were investigated (Bartlett, Burleson, & Santrock, 1982). Nonetheless, since their procedure entailed mood self-induction ("think of a happy/sad event and how you felt"), and a measure consisting of a series of schematic faces purporting to range from "very happy" to "very sad", no direct comparison may be made between the two studies. What is of special note, however, is the fact that based on a 5-point scale, where "1 = very happy" and "5 = very sad", the Bartlett et al. "sad-conditions" produced scores of 2.43 and 2.58, while the "happy-conditions" attained levels of 1.24 and 1.06. Clearly, this research also supports the finding that sadness is a dimension which is not considerably affected by the vagaries of everyday life.

6. Both Royce (1950, 1967) and Cattell (1965) give cogent presentations regarding the relationship of variance analysis to factor analysis.

TABLES FOR CHAPTER VII

Table 7.1

Summary of Construct Validation Results: Edmonton Sample[a]

PAMS Subscale	Hypothesis 1a exploratory FA	Hypothesis 1b confirmatory FA	Hypothesis 1c differential R[b] analysis	Hypothesis 1d factor invariance	Hypothesis 1e scale-item[c] characteristics
Surgency	E/F	E/F	E+F	E+F	E/F, E/F, E+F
Sadness	E/F	E/F	E+F	E+F	E/F, E/F, E+F
Aggression	E/F	E/F	E+F	E+F	E/F, E/F, E+F
Mastery/ Self-Esteem	E/F	E/F	E+F	E+F	E/F, E/F

[a] Indicators of hypothesis confirmation (significant results) are presented as E for the Exam condition, and F for the Film condition.

[b] dR-analysis, factor invariance, and the μ **index** are based on combined analyses of the Exam and Film conditions.

[c] The three sets of indicators represent the measures of internal homogeneity, coefficient alpha, and the μ index, respectively.

Table 7.2

Summary of Construct Validation Results: Wetaskiwin Sample[a]

PAMS Subscale	Hypothesis 2a exploratory FA	Hypothesis 2b confirmatory FA	Hypothesis 2c differential R[b] analysis	Hypothesis 2d factor[c] invariance	Hypothesis 2e scale-item[d] characteristics
Surgency	M/A	M/A	M+A	M+A M+E, M+F, A+E, A+F	M/A, M/A, M+A
Sadness	M/A	M/A	M+A	M+A M+E, M+F, A+E, A+F	M/A, M/A
Aggression	M/A	M/A	M+A	M+A M+E, M+F, A+E, A+F	M/A, M/A, M+A
Mastery/ Self-Esteem	M/A	M/A	M+A	M+A M+E, M+F, A+E, A+F	M/A, M/A

[a] Indicators of hypothesis confirmation (significant results) are presented as M for the Morning data, and A for the Afternoon data.

[b] dR-analysis, factor invariance, and the μ index are based on combined analyses of the Morning and Afternoon conditions.

[c] The four sets of indicators represent comparisons between each of the Wetaskiwin conditions (Morning, Afternoon) and each of those present in the Edmonton study (Exam, Film).

[d] The three sets of indicators represent the measures of internal homogeneity, coefficient alpha, and the μ index, respectively.

Table 7.3

Summary of Criterion-Related Validation Results: Edmonton Sample[a]

PAMS Subscale	Hypothesis 1a	Hypothesis 1b	Hypothesis 1c	Hypothesis 1d
	Anova on conditions: scale & items[b]	Anova on gender: scale & items	Anova on grades: scale & items	Anova on time-of-day[c]
Surgency	EF (5)	BG (5)	Gr (5)	EF/G (E)
Sadness	EF (1)		Gr (2)	E /G (E)
Aggression	EF (2)	BG (4)	Gr (2)	EF/G (F)/Gr 5 & 6 (F)
Mastery/ Self-Esteem	EF (4)	BG (4)	Gr (3)	E /G (E)/Gr 5 (F)

[a] The three sets of indicators represent significant results for the Exam & Film conditions, Boy & Girl samples, and Grade analyses.

[b] Numbers in parentheses indicate number of items which were significant discriminators.

[c] Letters in parentheses indicate the condition which produced significant effects for gender/grade.

Table 7.4

Summary of Criterion-Related Validation Results: Wetaskiwin Sample[a]

PAMS Subscale	Hypothesis 2a	Hypothesis 2b	Hypothesis 2c	Hypothesis 2d
	Anova on conditions: scale & items[b]	Anova on gender: scale & items	Anova on grades: scale & items	Anova on time-of-day[c]
Surgency	Sc (5)	BG (4)	Gr (3)	Sc (MA)/BG/Gr
Sadness	Sc (2)	BG (1)	Gr (2)	/BG/
Aggression	Sc (5)	BG (5)	Gr (4)	Sc (M)/BG/Gr
Mastery/ Self-Esteem	Sc (5)	BG (5)	Gr (2)	Sc (MA)/BG

[a] The three sets of indicators represent significant results for the School conditions, Boy & Girl samples, and Grade analyses.

[b] Numbers in parentheses indicate number of items which were significant discriminators.

[c] Letters in parentheses indicate the condition (Morning vs Afternoon) which produced significant effects for school.

Table 7.5

Summary of Environmental (School) Mood Effects Over Time[a]

PAMS	Schools							
Subscale	Norwood		**Centennial**		Parkdale		McMurdo	
Surgency[b] (p<.01)								
Grade 3							no grade 3	
4			–					+
5		+	-			+		
6		+		+				+
Sadness (p<.025)								
Grade 3				+	–		no grade 3	
4							–	
5		+	–			+		+
6		+		+				+
Aggression (p<.001)								
Grade 3	–		–		–		no grade 3	
4			–		–			+
5		+	–			+		
6	–			+	–		–	
Mastery/ Self-Esteem (p<.01)								
Grade 3		+				+	no grade 3	
4		+	–		-		–	
5		+	–				–	
6		+				+	–	
Total	-2	+9	-8	+4	-5	+5	-5	+5

[a] Information presented is based on repeated-measures anova (i.e., the mood effects of exposure to the school environment over the course of one day)

[b] Anovar differences are represented by the following signs:

"+" = positive mood effect (i.e., increase in positive mood and decrease in negative mood)

"–" = **negative** mood effect (i.e., increase in negative mood and decrease in positive mood)

VIII. THEORETICAL AND PRACTICAL IMPLICATIONS

Common sense beliefs regarding the antecedents and consequents of affect range from practical methods for changing mood, to the assertions about which behaviors may or may not be emitted in a particular state. Nowlis (1977) lists four classes of occasionally overlapping antecedents: 1) emotional provocations and counter provocations; 2) environmental contingencies and habitability; 3) somatic and psychosomatic processes; and 4) drugs. Research studies based on these four classes have yielded serendipitous results which have led to new areas of interest, such as how mood states fit into the scheme of long-term personality characteristics, or, how child mood states compare to those of the adult (Schokman-Gates, 1981). Additionally, investigations have been conducted into the relationships between affect and various consequents, such as attitude-, feeling-, and behavior-alterations. The most notable research at the present, however, is in the areas of experimental personality and social psychology, where mood checklists for adults are being employed to investigate the relationships between sets of independent and dependent variables (for a review of these studies see Howarth & Schokman-Gates, 1981). It is because of the broad implications posed by these adult mood adjective checklist studies that the development and validation of a pre-adolescent mood scale is so important.

A. Theoretical Implications

Mood and Behavior

Affect has long been viewed as a "general setting" condition for a variety of self- and other-oriented behaviors (Tomkins, 1965), with specific mood factors representing complex behavioral systems which fluctuate as orientations and bodily functions of the individual change (Nowlis, 1965). For example, negative affect, by definition (Rosenhan, Underwood, & Moore, 1974), increases psychological distance between individuals, while it also brings about an actual physical-distancing response; conversely, positive affect decreases both the psychological and behavioral remoteness. Moreover, items of behavior and the contingencies which may vary together as a result of mood change, are often seen as being heterogeneous because of the idiosyncratic features of the particular individual's life history: As Skinner noted, "the major behavioral items towards which one is disposed in mood may not occur, since what the person shows in mood depends also on what stimuli is encountered during that mood" (cited in Nowlis, 1963, p. 76).

What this view-point implies then, is that the oft-heard phrase of "to be in a mood" must refer to but a temporary dominance of one set of behavioral possibilities over that of others. Such dominance, of course, precludes the emergence of random and spontaneous activity, thereby bringing about a restriction in the individual's behavioral repertoire. When such constraints last for any appreciable amount of time, the unpleasant consequences are often attributed to negative mood states. Changing the environment then, by "unwinding" or "getting away from it all", has the effect of inducing a simpler mood state which allows once again for greater spontaneity and lability of response. As Nowlis points out, "mood is the effect on the self of its own configurations of activity" (1963, p. 85), and as such, it may be volitionally altered or not, depending upon the degree of self-awareness an individual has, and the confidence he/she has in being able to affect changes in the environment.

Both Cattell (1973) and Nowlis (1965) view this pervasive mood influence as being important for the understanding, prediction, and control of one's behavior through short periods of time. In fact, because it is often impractical to measure a person's state immediately before the situation of interest, Cattell believes that prediction may be estimated through the use of a behavior specification equation which takes the individual's mean mood levels for situation x into account. Additionally, he foresees the eventual development of an "econetic taxonomy" which will be capable of pinpointing those internal and external stimuli that set-off specific moods, and thereby, behavioral sets.

Zuckerman, likewise, asserts that an individual's mood cannot be accurately assessed without also taking into account the specific situation with which s/he is currently involved, and thus, he too, has developed a model for such a specification (1977 and 1980).These proposals, however, are all well and good for an area that has been fairly-well researched, but in order for them to be of any utility in the child domain, the nature and proper measurement of pre-adolescent mood states must be attended to first.

Mood and Individual Differences

Concomitant with the notion of moods as behavior systems, is the assertion that "cognition and affect are intimately intertwined and merged in most behavior" (Gorman & Wessman, 1974, p. 24). These investigators found that the high degree of variability in both the moods and behavior of an individual may be traced to his/her unique endowment of highly differentiated conceptual and emotional capacities.[1] Additionally, their results indicated that a person's cognitive style and characteristic mood patterns were related in such a way that basic personality dynamics could be discerned.

In a similar vein, a comprehensive series of studies conducted on the relationship of moods to personality (Wessman & Ricks, 1966), found that normal state fluctuations within individuals were consistently and demonstrably related to fluctuations in both their self-concepts and their modes of coping with frustrations. Mood-labile individuals were seen to have low degrees of mood denial and repression, while the steady state persons were consistent in their tendency to repress, conceal, or deny any emotional feelings.

Relating such findings to the child domain, Lipsitt (1958) constructed a children's self-concept measure whose scale scores were then correlated with the scores found for anxiety in grades four through six. Although no reliable grade or gender differences in mean self-concept scores were obtained, significant correlations were found for all grades and both sexes on these scales and those of the Children's Manifest Anxiety Scale. Further, Coopersmith (1968) found that boys (aged 10 - 12) who evinced high self-esteem during the testing session were more likely to express their feelings, readily adapt to the situation, and place trust in their abilities to cope with whatever confronted them, just as did the mood-labile adults of Wessman and Ricks (1966). In contrast, the low self-esteem children were fearful of expressing themselves, reluctant to become involved in new situations, and had little faith in their abilities to overcome obstacles; this pattern, again, was seen in the steady-state persons of the Wessman and Ricks (1966) Mood and Personality study. No mood measures were taken in the Coopersmith investigation, however, so no implications as to the youngsters' actual mood patterns may be drawn, even though behavioral patterns appear to be congruent with those of the adults.

Mood Measurement and Personality Assessment

In relation to the personality dynamics noted in the mood studies of Gorman and Wessman (1974), and Wessman and Ricks (1966), attention should also be paid to the projective vs objective techniques for personality assessment. Zuckerman, Persky, Eckman, and Hopkins (1967) compared results of the TAT and Holtzman's ink-blots (HIT) to an objective measure of mood states. The results suggested that both normal and patient populations may be more-validly assessed in a much shorter time, if use is made of an objective state instrument:

> The MAACL (Multiple Affect Adjective Checklist) which takes five to 10 minutes to administer and score can furnish a more valid measure...than the TAT and HIT techniques which may take an hour or more to administer and another hour or so to score. Furthermore, the objective techniques may be administered and scored by personnel with minimal training, while the projective techniques generally require the time of a trained psychologist. (p. 46)

Moreover, Schofield (1953) maintained that adjustment ratings based on the sentence completion method may be greatly attenuated or exacerbated by temporary moods and reactive states. Similar findings have also occurred in studies which have investigated mood affects on objective personality measures (e.g., Lamont & Brooks, 1973), thus indicating the need for due cognizance of such variables.

Taking these results into consideration, then, it appears that when the personality variables of interest are either affected by moods, or are themselves variables within that domain (be they of the adult or child), the most efficacious form of assessment would include the use of a mood adjective checklist.

B. Practical Implications

Emotional Development in Children

Turning now to practical implications posed by such a child instrument, prominent among these would be its utility for increasing our knowledge of emotional development in children. For, as was noted in my Master's thesis (Schokman-Gates, 1981), very few studies have attempted to look at the role of emotion as it relates to child adaptation and growth[2]--this, in spite of the fact that affect has long been a corner-stone of the psychoanalytic field. One individual, however, who has discerned the significance of such investigations, is Yarrow (1979), who noted that in order to study the developmental stages of childhood, "we need to distinguish how children come to recognize their own emotional states, how they learn to recognize the feelings of others, and how they learn to label their own emotions and the emotions of others" (p.954).

In a similar vein, Yarrow maintained that research was also needed so a determination could be made about how the child attains a positive regard for him/herself. This form of evaluation in youngsters is considered to be of prime importance to emotional and personality development, since it has been found to be associated with the child's perception of his/her ability to control the immediate environment. Nonetheless, "before we can explore these relationships, we need to develop sensitive indices of mastery [in children]" (Yarrow, 1979, p. 956). The present research program may be of great service in this endeavor, since it has determined that mastery and self-esteem are intimately related (please see my Master's thesis data) and that they may be sensitively and validly assessed by the **Pre-Adolescent Mood Scale** (please refer back to the data presented in this thesis). Moreover, because children are viewed as being "generally unable to sustain moods since they lack ego differentiation, stability of object cathexes, tolerance for tension, and resistance to substitute objects and gratifications" (Wessman & Ricks, 1966), just such hypotheses may be tested out now that an appropriate state measure is available.

Returning to the issue of positive self-regard and how it relates to moods, the studies of Coopersmith (1968) and Gelfand (1962) indicate that children's responses to experimental contingencies are significantly related to their immediate feelings of mastery and self-esteem. In a similar vein, experimentally-induced levels of affect in elementary school children has been found to significantly alter their responses in regard to generosity (Barnett, King, & Howard, 1979; Underwood, Froming, & Moore, 1977). No objective measures of the youngster's actual mood states were taken, however, so the above results rest mainly upon supposition as to the affective dimensions and levels involved.

Due to the fact that few childhood mood studies exist, with those that do relying upon subjective analyses of the moods purported (e.g., the two studies reported above), the remainder of this section will be devoted to implications for pre-adolescent research as found in the adolescent and adult literature. One significant issue in this field is that of "state vs trait" in the prediction of behaviors.

State vs Trait Measurement

Several investigators (e.g., Gouaux, Lamberth, & Friedrich, 1972; Martin, 1959) have found that momentary moods are more powerful determinators of interpersonal attraction responses and stress responses than are the affects of the allegedly-stable traits. Likewise, Patrick, Zuckerman, and Masterson (1974) and Zuckerman et al. (1967b) obtained results which indicate that a single administration of a trait test is inferior to a a test sampling of states when general personality characteristics are to be described, or when behavior is to be predicted.

Taken together, these and other results (Zuckerman, 1976) strongly suggest that a state measure administered just prior to the incidence of note, be it experimental or not, is more likely to predict individual behaviors in that situation than would a general trait measure. Such findings may have very important implications for the area of child personality, since a more veridical measure of children's traits may actually be found by doing a time-series analysis using repeated testing with state instruments (see Howarth & Schokman-Gates, 1981, for a discussion of P-technique analysis in mood measurement). This would give estimates of variability for the dimensions involved, in addition to their mean levels. Further, in the course of such testing, mood responses to different kinds of situations could be sampled, as could those states which are dependent on time-of-day variables. Although such an approach may be time-consuming (depending upon the type of instrument employed), it is believed that a more accurate picture of childhood personality would obtain since it would take into account the powerful mood-effects of situation and time, and therefore, also be able to account for many aspects of behavior[4].

Situational and Diurnal Mood-Effects

In regard to these powerful affects of situation and time, a number of studies have been conducted which highlight their very cogent relationship to moods. Among these include investigations into temperature and other weather variables (e.g., Cunningham, 1979; Goldstein, 1972; Griffitt, 1970, and Veitch, 1971; Howarth & Crawford, 1983), sleep deprivation and satiation (e.g., Hendrick & Lilly, 1970; Roth, Kramer, & Lutz, 1976; Taub, Tanguay, & Clarkson, 1976), the home environment (Hughes, 1977), and social climate (Gerst & Sweetwood, 1973). As a companion area to these latter two, attention has also been accorded to the calming and stimulating mood-effects of music, light, and color, finding each to have significant implications for use in the home, school, and work place (e.g., Fisher & Greenberg, 1972; Ott, 1973; Shatin, 1970; Wexner, 1954; Wohlfarth & Sam, 1982). Furthermore, the emotional reactions of other individuals have been found to profoundly affect the mood state of the observer, with an imitation theory of affect being proposed as explanation (Abrams & King, 1978).

As an example of these last two areas of research, Walberg (1968a, 1969) conducted a series of studies which revealed that the classroom climate in high schools may be predicted from teacher and student personality. Specifically, class structure appeared to be related to both the teacher's affective reactions to classroom happenings, as well as to the students' reactions (Corey, 1973; McCandless, Castaneda, & Palermo, 1956; Trickett & Moos, 1973; Walberg, 1968b).

A further finding of this area (where positive mood states are believed to accrue from interpersonal interaction and teacher support), is that affective concern with the students as people, along with adequate content presentation, tends to increase the amount of material learned and retained^5. Moreover, such classroom milieus were discovered to induce feelings of security and interest, suggesting that such educational environments promote personal risk-taking, which in turn, may open doors to otherwise unattainable learning experiences (Trickett & Moos, 1974). On the other hand, there was found to be a pervasive mood of anger in students whose classrooms were characterized as being low in order, organization, and teacher involvement.

Clearly, these results indicate that instructors in junior and senior high schools can have considerable affects on the mood states of their charges. Such findings have very real and important implications for the future training of teachers, and the devising of instructional methods. The mood-effects of elementary school teachers, however, have not yet been investigated, since no appropriate state measure has been available until now. It is hoped that the Pre-

Adolescent Mood Scale will eventually be used to make just such a determination, and thus help in planning the most efficacious environment for classroom learning.

Another area in which the PAMS may also be of service is in relation to the influence of time-of-day variables on a child's mood state. Barton and Cattell (1974) broached this issue when they hypothesized and tested a model for diurnal mood-effects. In their conceptualization, psychological states were believed to be influenced by a complex interaction of environmental factors, with the level of any given state being viewed as a direct function of the duration of these environmental events. Further, they hypothesized that sleep brought about a characteristic mood-homeostasis which would attenuate an individual's negative states in the morning, but allow for their greater emergence as the day wore on. Research results have supported their model, and thus, they conclude that "with the current increase in the number of instruments designed to measure psychological states... it is important that the `time of testing' be fully understood before studies using such tests are misinterpreted" (p. 219).

In a similar vein, they suggest that just as norms have been developed for age and gender differences in trait measurement, separate norms for diurnal variation would be of great utility for state measurement. Thus, methodologically, it may be important "to know whether or not such state measures vary consistently as a function of time of day, before we examine what other correlates of change might exist" (Barton & Cattell, 1974, p. 219). From the results reported in the present investigation, it would seem likewise important to know how age and gender differences affect the area of child state measurement--for surely these characteristics have been shown in both the Edmonton and Wetaskiwin data to be very significant indeed. And thus, with the development and validation of the **Pre-Adolescent Mood Scale**, we now have a measure capable of making determinations regarding the potentially important mood-effects of time, as well as those of age and sex.

Mood Measurement and Clinical Intervention

The last major area to be considered in this section is that pertaining to implications for clinical use. There is an extensive literature in the adult domain relating to the beneficial mood-effects of clinical intervention (e.g., Borkovec & Grayson, 1980; Burns & Beck, 1978; Haskell, Pugatch, & McNair, 1969; Kovacs & Beck, 1979; Lazarus, 1975; Lorr, McNair, & Weinstein, 1964; Lorr, McNair, Weinstein, Michaux, & Raskin, 1961; McNair & Lorr, 1964; Meichenbaum & Butler, 1980), as well as to the fluctuations of mood states in psychiatric populations (e.g., see reference citations in Clyde, 1963; McNair, Lorr, & Droppleman, 1971b; Zuckerman & Lubin, 1965). Moreover, Zuckerman (1976) proposes the use of mood measures as daily assessment devices, in order to solve the mystery of "disappearing admission symptoms" in psychiatric patients. For, as Rosenhan noted, "the insane are not always insane...they were sane for long periods of time...the bizarre behaviors [and cognitions] upon which their diagnoses were allegedly predicted constituted only a small fraction of their total behavior" (1973, p. 254). Thus, by making daily, or even diurnal, assessments of these behavior and mood fluctuations, the course of the disorder, as well as the treatment- and drug-effects may be more clearly followed. Furthermore, if states are indeed more predictive of behavior than traits, than such assessment may eventually bring about the eradication of patient "labels" in favor of an emphasis on the ongoing states and behavior of the individual.

Transferring such ideas to the child domain, now that we do have a valid state instrument, a similar type of "mood charting" might be salutary for children who are having psychological problems. The Spielberger child measure (STAIC; Spielberger et al., 1973), has been found a useful indicator of transitory anxiety in children who are receiving counseling; additionally, it has been used as a countercheck on the effectiveness of specific behavioral procedures such as counter-conditioning and desensitization. Nonetheless, Yarrow (1979) asserts that effective preventive or therapeutic intervention cannot be given unless attention is also paid to the multiple affects that situation and state have on the child:

> We do not know a great deal about the kinds of preventive or therapeutic programs that are effective [for children]....Research is needed in which theoretically meaningful interventions are attempted and their interactions with temperamental [mood state] characteristics are evaluated.... Having identified both the environmental conditions and the temperamental [mood] characteristics and

> the ways in which they interact, we may be able to provide effective preventive or therapeutic conditions that will neutralize, reverse, or mitigate the damaging effects. (p. 955)

It would appear then, that in order for these interventions to be maximally effective, attention must be accorded to both the immediate, as well as ~~the~~ mean levels of childhood mood states. And thus, with the multiple state scales now available in the Pre-Adolescent Mood Scale, further specification as to the effectiveness of such treatment, or lack thereof, is presently possible.

In a similar vein, other practical implications for a child state measure may be gleaned from the work of Lorr and McNair (1982), who have completed extensive investigations in the adult domain. Adapting their six proposed research areas to the needs of the child realm, the following suggestions are offered for further studies employing the Pre-Adolescent Mood Scale:

1) the identification and assessment of mood states within normal pre-adolescents from different populations and under various experimental conditions;

2) the identification and assessment of individual mood states within pre-adolescent psychiatric outpatients, in order to determine their clinical status and course of treatment;

3) the evaluation of the relative effectiveness for children of various psychotropic drugs used in such treatment;

4) the comparison of various personality disorders described in DSM-III, to the characteristic mood profile found for pre-adolescents who have been diagnosed as having one of these disorders;

5) the assessment of the individual child's mood change produced by various forms of psychotherapy; and

6) the experimental assessment of pre-adolescent group responses to the mood influences of various non-psychiatric drugs and emotional stimuli.

Conclusion

As we have seen from a perusal of the adolescent and adult domains, the area of child mood state is rich in research and practical potential, nonetheless, in order for this potential to be realized, an adequately-designed mood instrument had to first be constructed. The present investigation was directed towards just such an objective. After an intensive series of mood validation studies were carried out, the results obtained indicated that the Pre-Adolescent Mood Scale is a valid and internally-reliable state measure, comprised of twenty items--five per factor--each of which makes a unique contribution to the overall measurement of childhood (ages 7-13) mood states. Nevertheless, further investigations, using different population samples and conditions (e.g., American children, controlled laboratory experimentation, etc.), are necessary before its ultimate utility may be established.

Borrowing from the conclusion to my Master's thesis (Schokman-Gates, 1981, p. 106), but all the more relevant to the spirit of this dissertation, I would like to present the following closing comments:

The ultimate test of any psychological discipline is the extent to which it increases our comprehension of human existence. The study of how children feel, how these moods are organized, and how their states affect behavior and cognition should therefore be elemental to our goals of understanding humankind. If any further attention paid to these childhood states augments our knowledge of Homo sapiens in general, then the present investigations may be considered at least a small contribution to a very important area of personology. For as Edith Hamilton noted, "We differ in nothing more than in our capacity to feel...upon that degree the dignity and significance of each life depends." (cited in Wessman & Ricks, 1966, p. 251).

Notes for Chapter VIII

1. Yarrow, in his 1979 article on emotional development in children, also broaches this subject of complex interrelatedness found for cognition and emotional states, noting that hypotheses regarding it have become more prominent in recent years. Further, he maintains that since "the development of control over the emotions is influenced by cognitive processes [such a fact] has both theoretical significance and important implications for preventive and therapeutic programs" (p. 953).

2. Reimanis (1974) found that psychosocial development was significantly related to feelings of happiness and elation in college students, and that a very predictable mood-psychosocial development relationship existed in the adult population.

3. In the adult literature, Lamont and Brooks (1973) reported that mood level at time of testing significantly affected the scores of Rotter's I-E scale for perception of control. These results suggest that individuals who are depressed perceive themselves as having a lesser degree of control over their environment than do those persons who report higher levels of immediate mood state. This interpretation

appears to be supported by the study of Harvey and Enzle (1977), who found that depressed subjects were significantly more dependent upon others than were those subjects who evinced an average or elated mood level. In a similar vein, Gatchel, Paulus, and Maples (1975) found that a "learned helplessness" induction procedure produced the decidedly negative moods of anxiety, depression, and hostility. Moreover, a number of recent investigators have also proposed connections between competence, self-esteem, and level of affect (e.g., Averill, 1980; Battle, 1980; Bohlin & Kjellborg, 1973; Burns & Beck, 1978; Epstein, 1982; Harter, 1978; Jones & Thelen, 1978; Lazarus, 1975; Lazarus et al., 1980; Plutchik, 1980a; and Russell & Mehrabian, 1977). Thus, perhaps the adult relationship between mastery and mood is not all that different from the one I found for the pre-adolescent sample.

4. Mussen and Eisenberg-Berg (1977) present an impressive monograph on the roots of prosocial behavior in children, noting that mood level and reinforcement may play important roles as determinants of sharing and helping responses. This assertion, however, is presented with caution, since it has not yet been objectively-tested in the natural environment.

5. Bower (1981) provides further evidence for the pervasive influence which mood may have on learning and retention. In his experiments on emotion and memory, it was found that "recall" mood interacted with "learning" mood, thus suggesting the presence of a state-dependent affect on memory processes. Similar results have also been obtained in the child domain (e.g., Masters, Barden & Ford, 1979).

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APPENDIX A

EDMONTON SAMPLE:

CONFIRMATORY ANALYSES AND SCALE RELIABILITY

Table A.1

Edmonton-Sample Confirmatory Factor Analysis: Exam

Maximum Likelihood (Rao's Canonical) Factoring: Varimax Rotated Matrix

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	14.191	51.5	51.1
2	7.945	28.8	80.3
3	3.013	10.9	91.3
4	2.404	8.7	100.0

	COMMUNALITY	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
SURE1	.693	.785	-.206	.105	-.159
SURE2	.624	.692	-.274	.200	-.172
SURE3	.752	.823	-.207	.115	-.137
SURE4	.590	.700	-.222	.162	-.160
SURE5	.541	.656	-.144	.237	-.185
SADE1	.334	-.052	.045	.003	.574
SADE2	.493	-.121	.184	-.044	.665
SADE3	.287	-.124	.235	.035	.464
SADE4	.286	-.069	.091	.065	.519
SADE5	.424	-.229	.300	-.000	.531
AGGE1	.455	-.212	.616	.038	.171
AGGE2	.396	-.073	.580	.215	.089
AGGE3	.520	-.192	.662	.088	.192
AGGE4	.623	-.223	.709	.150	.221
AGGE5	.607	-.190	.697	.164	.239
SEME1	.458	.361	.060	.569	.020
SEME2	.329	.365	-.014	.439	.055
SEME3	.530	.082	.195	.694	-.055
SEME4	.607	.142	.120	.756	.012
SEME5	.543	.074	.189	.703	.085

Alpha Factoring: Varimax Rotated Matrix

```
FACTOR          EIGENVALUE     PCT OF VAR     CUM PCT

   1             9.999           50.0           50.0
   2             6.301           31.5           81.5
   3             2.556           12.8           94.3
   4             1.146            5.7          100.0

        COMMUNALITY  FACTOR  1    FACTOR  2    FACTOR  3    FACTOR  4

SURE1   .673          .767         -.224          .101        -.156
SURE2   .634          .702         -.274          .187        -.175
SURE3   .739          .815         -.211          .108        -.136
SURE4   .585          .702         -.220          .149        -.147
SURE5   .557          .674         -.146          .229        -.175
SADE1   .336         -.062          .036          .000         .575
SADE2   .462         -.124          .206         -.042         .634
SADE3   .302         -.120          .249          .040         .473
SADE4   .337         -.063          .080          .060         .569
SADE5   .398         -.221          .317          .005         .499
AGGE1   .502         -.187          .665          .032         .153
AGGE2   .393         -.069          .577          .217         .094
AGGE3   .529         -.192          .673          .089         .175
AGGE4   .596         -.234          .681          .162         .224
AGGE5   .576         -.213          .663          .183         .238
SEME1   .474          .384          .077          .566         .023
SEME2   .331          .380          .006          .430         .034
SEME3   .538          .086          .189          .702        -.057
SEME4   .591          .149          .114          .745         .012
SEME5   .545          .072          .172          .709         .092
```

Table A.2

Edmonton-Sample Confirmatory Factor Analysis: Film

Maximum Likelihood (Rao's Canonical) Factoring: Varimax Rotated Matrix

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	11.012	42.2	42.2
2	9.108	34.9	77.1
3	3.491	13.4	90.5
4	2.491	9.5	100.0

	COMMUNALITY	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
SURF1	.598	.717	.118	-.235	-.124
SURF2	.601	.735	.127	-.195	-.081
SURF3	.685	.793	.117	-.168	-.121
SURF4	.454	.640	.080	-.155	-.115
SURF5	.568	.679	.124	-.112	-.281
SADF1	.306	-.021	.030	.080	.546
SADF2	.605	-.177	-.033	.069	.753
SADF3	.212	-.044	-.019	.235	.393
SADF4	.335	-.081	.077	.122	.555
SADF5	.467	-.236	.030	.257	.586
AGGF1	.490	-.241	.073	.638	.140
AGGF2	.384	-.068	.138	.588	.123
AGGF3	.358	-.117	.098	.536	.216
AGGF4	.454	-.192	.177	.592	.186
AGGF5	.510	-.194	.210	.642	.126
SEMF1	.453	.303	.588	.109	.049
SEMF2	.227	.328	.342	-.014	.047
SEMF3	.654	.098	.774	.210	.020
SEMF4	.705	.074	.830	.101	-.007
SEMF5	.638	.063	.748	.272	.021

Alpha Factoring: Varimax Rotated Matrix

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	9.643	48.2	48.2
2	6.204	31.0	79.2
3	2.795	14.0	93.2
4	1.357	6.8	100.0

	COMMUNALITY	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
SURF1	.574	.700	.116	-.241	-.114
SURF2	.580	.716	.132	-.206	-.083
SURF3	.679	.792	.109	-.163	-.116
SURF4	.453	.638	.086	-.150	-.123
SURF5	.608	.709	.131	-.106	-.278
SADF1	.338	-.033	.002	.088	.574
SADF2	.579	-.192	-.027	.064	.734
SADF3	.234	-.032	-.015	.237	.420
SADF4	.355	-.071	.085	.120	.573
SADF5	.400	-.262	.067	.238	.519
AGGF1	.490	-.250	.088	.635	.126
AGGF2	.400	-.062	.136	.602	.118
AGGF3	.370	-.112	.089	.543	.234
AGGF4	.452	-.197	.169	.584	.208
AGGF5	.499	-.217	.218	.625	.113
SEMF1	.480	.320	.600	.108	.074
SEMF2	.232	.338	.349	-.010	.046
SEMF3	.632	.096	.762	.205	.023
SEMF4	.715	.072	.837	.101	-.011
SEMF5	.625	.057	.740	.273	.007

Table A.3

Edmonton Sample: Intra-Scale Reliabilities for Surgency

Exam Condition

```
                  RELIABILITY COEFFICIENTS              5  ITEMS

                  ALPHA =  0.89429          STANDARDIZED ITEM ALPHA =  0.89505

                                                       MEANS                  STD DEV

                   1.      SURE1  CHEERFUL            1.91468                 1.08058
                   2.      SURE2  GLAD                1.90675                 1.08909
                   3.      SURE3  JOYFUL              1.78373                 1.12218
                   4.      SURE4  LIKE SMILING        1.65079                 1.14941
                   5.      SURE5  WONDERFUL           1.69841                 1.17644

        # OF CASES =     504.0

STATISTICS FOR               MEAN        VARIANCE        STD DEV     # VARIABLES
         SCALE             8.95437       22.20268        4.71197               5

ITEM-TOTAL STATISTICS              SCALE          SCALE       CORRECTED
                                    MEAN        VARIANCE        ITEM-         SQUARED              ALPHA
                                  IF ITEM        IF ITEM        TOTAL         MULTIPLE            IF ITEM
                                  DELETED        DELETED     CORRELATION    CORRELATION           DELETED

                  SURE1           7.03968       14.68232        0.76714        0.61029            0.86560
                  SURE2           7.04762       14.86055        0.73314        0.54018            0.87286
                  SURE3           7.17063       14.20144        0.79712        0.65044            0.85836
                  SURE4           7.30357       14.52993        0.72485        0.53009            0.87478
                  SURE5           7.29595       14.65205        0.68470        0.46879            0.88432
```

Film Condition

```
                 RELIABILITY COEFFICIENTS              5  ITEMS

                 ALPHA =  0.86765          STANDARDIZED ITEM ALPHA =  0.86874

                                                      MEANS                  STD DEV

                  1.      SURF1  CHEERFUL            2.18182                 1.02099
                  2.      SURF2  GLAD                2.12860                 0.99392
                  3.      SURF3  JOYFUL              2.02882                 1.07147
                  4.      SURF4  LIKE SMILING        1.79823                 1.09406
                  5.      SURF5  WONDERFUL           1.99335                 1.11851

        # OF CASES =     451.0

STATISTICS FOR               MEAN        VARIANCE        STD DEV     # VARIABLES
         SCALE            10.13082       18.39396        4.28882               5

ITEM-TOTAL STATISTICS              SCALE          SCALE       CORRECTED
                                    MEAN        VARIANCE        ITEM-         SQUARED              ALPHA
                                  IF ITEM        IF ITEM        TOTAL         MULTIPLE            IF ITEM
                                  DELETED        DELETED     CORRELATION    CORRELATION           DELETED

                  SURF1           7.94900       12.36406        0.69462        0.51742            0.83900
                  SURF2           8.00222       12.42000        0.71174        0.51319            0.83537
                  SURF3           8.10200       11.74068        0.74975        0.58546            0.82475
                  SURF4           8.33259       12.36469        0.62804        0.40432            0.85569
                  SURF5           8.13747       11.91884        0.67643        0.45943            0.84388
```

Table A.4

Edmonton Sample: Intra-Scale Reliabilities for Sadness

Exam Condition

```
        RELIABILITY COEFFICIENTS              5  ITEMS

        ALPHA =  0.72021         STANDARDIZED ITEM ALPHA =  0.72313

                                         MEANS             STD DEV

         1.      SADE1  LONELY          0.64087            1.00298
         2.      SADE2  SAD             0.50198            0.88054
         3.      SADE3  TRAPPED         0.54167            0.97394
         4.      SADE4  UNWANTED        0.57143            0.98035
         5.      SADE5  UPSET           0.63095            1.04507

    # OF CASES =     504.0

STATISTICS FOR            MEAN       VARIANCE      STD DEV    # VARIABLES
       SCALE            2.88690      11.28539      3.35937          5

ITEM-TOTAL STATISTICS             SCALE        SCALE      CORRECTED
                                  MEAN        VARIANCE      ITEM-        SQUARED         ALPHA
                                 IF ITEM      IF ITEM       TOTAL        MULTIPLE       IF ITEM
                                 DELETED      DELETED    CORRELATION   CORRELATION      DELETED

                    SADE1        2.24603      7.76837      0.44913       0.25905        0.68504
                    SADE2        2.38492      7.76407      0.55960       0.35103        0.64507
                    SADE3        2.34524      7.86467      0.45256       0.21906        0.68324
                    SADE4        2.31548      7.79889      0.46122       0.22762        0.6799C
                    SADE5        2.25595      7.44330      0.48224       0.28584        0.67217
```

Film Condition

```
        RELIABILITY COEFFICIENTS              5  ITEMS

        ALPHA =  0.72445         STANDARDIZED ITEM ALPHA =  0.72766

                                         MEANS             STD DEV

         1.      SADF1  LONELY          0.61863            0.99376
         2.      SADF2  SAD             0.41685            0.85327
         3.      SADF3  TRAPPED         0.46341            0.92634
         4.      SADF4  UNWANTED        0.51441            0.92455
         5.      SADF5  UPSET           0.53659            0.96856

    # OF CASES =     451.0

STATISTICS FOR            MEAN       VARIANCE      STD DEV    # VARIABLES
       SCALE            2.54989      10.38584      3.22271          5

ITEM-TOTAL STATISTICS             SCALE        SCALE      CORRECTED
                                  MEAN        VARIANCE      ITEM-        SQUARED         ALPHA
                                 IF ITEM      IF ITEM       TOTAL        MULTIPLE       IF ITEM
                                 DELETED      DELETED    CORRELATION   CORRELATION      DELETED

                    SADF1        1.93126      6.90415      0.47758       0.23944        0.68077
                    SADF2        2.13304      6.89782      0.61578       0.40253        0.63001
                    SADF3        2.08647      7.65695      0.36492       0.15239        0.72238
                    SADF4        2.03548      7.10086      0.49318       0.25028        0.67392
                    SADF5        2.01330      6.86427      0.48581       0.31570        0.67693
```

Table A.5

Edmonton Sample: Intra-Scale Reliabilities for Aggression

Exam Condition

```
                 RELIABILITY COEFFICIENTS              5  ITEMS

                 ALPHA =  0.83596          STANDARDIZED ITEM ALPHA =  0.83689

                                                  MEANS                 STD DEV

                   1.      AGGE1 BAD TEMPERED     0.50992               0.85062
                   2.      AGGE2 BOSSY            0.40278               0.79915
                   3.      AGGE3 FURIOUS          0.55159               0.94654
                   4.      AGGE4 LIKE HITTING     0.77778               1.13424
                   5.      AGGE5 MEAN             0.53175               0.96612

          # OF CASES =     504.0

STATISTICS FOR             MEAN       VARIANCE      STD DEV    # VARIABLES
        SCALE            2.77381      13.51931      3.67686              5

ITEM-TOTAL STATISTICS            SCALE       SCALE     CORRECTED
                                 MEAN       VARIANCE     ITEM-       SQUARED         ALPHA
                                IF ITEM     IF ITEM      TOTAL       MULTIPLE       IF ITEM
                                DELETED     DELETED   CORRELATION   CORRELATION     DELETED

                   AGGE1        2.26389     9.59424     0.60755       0.38114       0.81157
                   AGGE2        2.37103    10.06286     0.55577       0.31372       0.82461
                   AGGE3        2.22222     8.94455     0.64977       0.43291       0.79936
                   AGGE4        1.99603     7.78527     0.70266       0.51736       0.78674
                   AGGE5        2.24206     8.64904     0.69280       0.50084       0.78689
```

Film Condition

```
                 RELIABILITY COEFFICIENTS              5  ITEMS

                 ALPHA =  0.78067          STANDARDIZED ITEM ALPHA =  0.78766

                                                  MEANS                 STD DEV

                   1.      AGGF1  BAD TEMPERED    0.33481               0.70623
                   2.      AGGF2  BOSSY           0.31264               0.69429
                   3.      AGGF3  FURIOUS         0.34812               0.72778
                   4.      AGGF4  LIKE HITTING    0.60754               1.02798
                   5.      AGGF5  MEAN            0.45898               0.89193

          # OF CASES =     451.0

STATISTICS FOR             MEAN       VARIANCE      STD DEV    # VARIABLES
        SCALE            2.06208       8.95614      2.99268              5

ITEM-TOTAL STATISTICS            SCALE       SCALE     CORRECTED
                                 MEAN       VARIANCE     ITEM-       SQUARED         ALPHA
                                IF ITEM     IF ITEM      TOTAL       MULTIPLE       IF ITEM
                                DELETED     DELETED   CORRELATION   CORRELATION     DELETED

                   AGGF1        1.72727     6.34990     0.59211       0.35095       0.73196
                   AGGF2        1.74945     6.57931     0.53199       0.29537       0.74954
                   AGGF3        1.71397     6.55134     0.50332       0.27478       0.75674
                   AGGF4        1.45455     5.19960     0.57588       0.35885       0.74201
                   AGGF5        1.60310     5.55101     0.62081       0.39017       0.71670
```

Table A.6

Edmonton Sample: Intra-Scale Reliabilities for Mastery/Self-Esteem

Exam Condition

```
                    RELIABILITY COEFFICIENTS             5  ITEMS

                    ALPHA =  0.80109          STANDARDIZED ITEM ALPHA =  0.80198

                                                   MEANS              STD DEV

                     1.      SEME1  BRAVE              1.66468              1.05921
                     2.      SEME2  HANDSOME PRETTY    1.46032              1.14999
                     3.      SEME3  POWERFUL           1.37500              1.14211
                     4.      SEME4  STRONG             1.65675              1.10270
                     5.      SEME5  TOUGH              1.34921              1.13374

               # OF CASES =     504.0

         STATISTICS FOR           MEAN         VARIANCE        STD DEV     # VARIABLES
                   SCALE        7.50595        17.40354        4.17176              5

         ITEM-TOTAL STATISTICS           SCALE          SCALE       CORRECTED
                                         MEAN         VARIANCE        ITEM-          SQUARED           ALPHA
                                        IF ITEM        IF ITEM        TOTAL          MULTIPLE         IF ITEM
                                        DELETED        DELETED     CORRELATION     CORRELATION        DELETED

                          SEME1         5.84127       12.00259       0.58303         0.35535          0.76366
                          SEME2         6.04563       12.34980       0.46164         0.23740          0.80132
                          SEME3         6.13095       11.37049       0.61381         0.40153          0.75339
                          SEME4         5.84921       11.31320       0.65712         0.46531          0.74002
                          SEME5         6.15675       11.42469       0.61239         0.41702          0.75381
```

Film Condition

```
                    RELIABILITY COEFFICIENTS             5  ITEMS

                    ALPHA =  0.81476          STANDARDIZED ITEM ALPHA =  0.81516

                                                   MEANS              STD DEV

                     1.      SEMF1  BRAVE              1.63858              1.10563
                     2.      SEMF2  HANDSOME PRETTY    1.60976              1.15404
                     3.      SEMF3  POWERFUL           1.47450              1.15129
                     4.      SEMF4  STRONG             1.76940              1.12745
                     5.      SEMF5  TOUGH              1.43681              1.17846

               # OF CASES =     451.0

         STATISTICS FOR           MEAN         VARIANCE        STD DEV     # VARIABLES
                   SCALE        7.92905        18.78162        4.33378              5

         ITEM-TOTAL STATISTICS           SCALE          SCALE       CORRECTED
                                         MEAN         VARIANCE        ITEM-          SQUARED           ALPHA
                                        IF ITEM        IF ITEM        TOTAL          MULTIPLE         IF ITEM
                                        DELETED        DELETED     CORRELATION     CORRELATION        DELETED

                          SEMF1         6.29047       12.81100       0.59993         0.36426          0.77993
                          SEMF2         6.31929       14.29338       0.36172         0.15016          0.84753
                          SEMF3         6.45455       11.93293       0.69439         0.54351          0.75073
                          SEMF4         6.15965       11.87668       0.72498         0.56226          0.74187
                          SEMF5         6.49224       11.87080       0.66484         0.51676          0.75861
```

APPENDIX B

WETASKIWIN SAMPLE:
CONFIRMATORY ANALYSES AND SCALE RELIABILITY

Table B.1

Wetaskiwin-Sample Confirmatory Analysis: Morning

Maximum Likelihood (Rao's Canonical) Factoring: Varimax Rotated Matrix

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	10.053	41.0	41.0
2	7.663	31.3	72.3
3	4.520	18.4	90.7
4	2.280	9.3	100.0

	COMMUNALITY	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
SURM1	.544	.727	.040	-.091	-.075
SURM2	.516	.692	.166	-.048	-.088
SURM3	.663	.797	.107	-.108	-.068
SURM4	.531	.664	.133	-.268	.036
SURM5	.514	.619	.193	-.243	-.187
SADM1	.415	.002	-.035	.307	.565
SADM2	.598	-.152	-.010	.112	.750
SADM3	.376	-.047	-.018	.519	.322
SADM4	.432	.019	-.057	.409	.510
SADM5	.508	-.207	.012	.328	.598
AGGM1	.275	-.240	.032	.417	.205
AGGM2	.219	-.045	.146	.429	.108
AGGM3	.245	-.081	.049	.408	.263
AGGM4	.457	-.234	.073	.627	.064
AGGM5	.447	-.163	.081	.628	.143
SEMM1	.392	.195	.581	.057	.112
SEMM2	.340	.138	.538	-.110	.139
SEMM3	.659	.071	.791	.163	-.052
SEMM4	.689	.109	.803	.081	-.159
SEMM5	.611	.029	.744	.187	-.147

Alpha Factoring: Varimax Rotated Matrix

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	9.574	47.9	47.9
2	5.965	29.8	77.7
3	2.994	15.0	92.7
4	1.467	7.3	100.0

	COMMUNALITY	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
SURM1	.511	.696	.046	-.139	-.065
SURM2	.504	.683	.169	-.052	-.079
SURM3	.659	.792	.123	-.098	-.080
SURM4	.536	.688	.119	-.217	.023
SURM5	.514	.628	.199	-.217	-.181
SADM1	.432	.002	-.033	.278	.595
SADM2	.587	-.176	.013	.089	.741
SADM3	.373	-.039	-.035	.505	.339
SADM4	.495	.055	-.090	.433	.544
SADM5	.486	-.224	.017	.328	.573
AGGM1	.289	-.245	.053	.431	.200
AGGM2	.226	-.045	.151	.437	.101
AGGM3	.267	-.090	.046	.434	.262
AGGM4	.421	-.253	.087	.586	.080
AGGM5	.487	-.182	.077	.661	.104
SEMM1	.375	.175	.576	.060	.097
SEMM2	.333	.143	.537	-.090	.128
SEMM3	.660	.084	.787	.174	-.056
SEMM4	.684	.110	.803	.072	-.148
SEMM5	.583	.035	.733	.167	-.126

Table B.2

Wetaskiwin-Sample Confirmatory Analysis: Afternoon

Maximum Likelihood (Rao's Canonical) Factoring: Varimax Rotated Matrix

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	15.871	54.1	54.1
2	9.195	31.4	85.5
3	4.260	14.5	100.0

	COMMUNALITY	FACTOR 1	FACTOR 2	FACTOR 3
SURA1	.724	.842	.096	-.078
SURA2	.629	.766	.170	-.120
SURA3	.782	.864	.184	-.029
SURA4	.549	.734	.021	-.095
SURA5	.614	.719	.236	-.203
SADA1	.349	.016	-.059	.587
SADA2	.480	-.175	-.085	.665
SADA3	.263	-.147	.074	.486
SADA4	.491	-.103	-.074	.689
SADA5	.506	-.410	.001	.581
AGGA1	.515	-.579	.251	.342
AGGA2	.361	-.503	.241	.222
AGGA3	.507	-.499	.200	.467
AGGA4	.492	-.547	.252	.359
AGGA5	.513	-.495	.333	.396
SEMA1	.502	.086	.703	.019
SEMA2	.290	.202	.495	-.068
SEMA3	.608	-.094	.772	.051
SEMA4	.705	-.014	.839	-.023
SEMA5	.645	-.084	.799	-.022

Alpha Factoring: Varimax Rotated Matrix

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	10.997	55.0	55.0
2	5.757	28.8	83.8
3	3.246	16.2	100.0

	COMMUNALITY	FACTOR 1	FACTOR 2	FACTOR 3
SURA1	.679	.811	.122	-.075
SURA2	.627	.760	.203	-.096
SURA3	.739	.831	.218	-.018
SURA4	.504	.703	.051	-.081
SURA5	.599	.693	.277	-.206
SADA1	.414	.021	-.057	.641
SADA2	.453	-.201	-.086	.636
SADA3	.271	-.198	.093	.487
SADA4	.530	-.121	-.064	.715
SADA5	.517	-.424	.010	.581
AGGA1	.547	-.643	.249	.270
AGGA2	.378	-.551	.231	.145
AGGA3	.513	-.559	.203	.405
AGGA4	.506	-.597	.230	.311
AGGA5	.553	-.585	.338	.311
SEMA1	.511	.078	.710	.024
SEMA2	.291	.202	.498	-.052
SEMA3	.604	-.121	.767	.030
SEMA4	.701	-.029	.836	-.038
SEMA5	.600	-.092	.769	-.019

Table B.3

Wetaskiwin-Sample Confirmatory Analysis: Afternoon Extraction of Four Factors

Maximum Likelihood (Rao's Canonical) Factoring: Varimax Rotated Matrix

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	17.277	50.8	50.8
2	9.870	29.0	29.8
3	4.501	13.2	93.0
4	2.391	7.0	100.0

	COMMUNALITY	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
SURA1	.734	.815	.067	-.098	-.237
SURA2	.628	.702	.173	-.104	-.308
SURA3	.799	.856	.147	-.057	-.203
SURA4	.552	.694	.001	-.107	-.244
SURA5	.644	.725	.190	-.249	-.142
SADA1	.383	.022	-.040	.617	.025
SADA2	.489	-.126	-.087	.660	.175
SADA3	.278	-.112	.079	.493	.129
SADA4	.523	-.074	-.063	.708	.111
SADA5	.520	-.358	.008	.583	.226
AGGA1	.552	-.406	.172	.236	.549
AGGA2	.449	-.318	.140	.091	.565
AGGA3	.523	-.341	.130	.376	.499
AGGA4	.542	-.369	.170	.256	.558
AGGA5	.716	-.237	.195	.230	.754
SEMA1	.509	.125	.698	.018	.073
SEMA2	.297	.208	.499	-.060	-.032
SEMA3	.604	-.008	.744	.020	.222
SEMA4	.732	.035	.847	-.023	.113
SEMA5	.663	-.030	.801	-.025	.143

Alpha Factoring: Varimax Rotated Matrix

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	10.347	51.7	51.7
2	5.578	27.9	79.6
3	3.177	15.9	95.5
4	0.898	4.5	100.0

	COMMUNALITY	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
SURA1	.720	.800	.064	-.099	-.256
SURA2	.631	.712	.171	-.108	-.287
SURA3	.787	.844	.150	-.046	-.225
SURA4	.537	.685	.003	-.101	-.241
SURA5	.672	.746	.200	-.243	-.131
SADA1	.414	.037	-.056	.639	.033
SADA2	.457	-.111	-.114	.622	.209
SADA3	.291	-.139	.113	.502	.084
SADA4	.528	-.070	-.071	.709	.127
SADA5	.534	-.375	.032	.590	.212
AGGA1	.582	-.390	.163	.223	.594
AGGA2	.479	-.286	.127	.080	.612
AGGA3	.522	-.350	.142	.371	.492
AGGA4	.516	-.382	.164	.274	.517
AGGA5	.677	-.262	.213	.242	.711
SEMA1	.533	.120	.718	.025	.057
SEMA2	.298	.205	.502	-.050	-.044
SEMA3	.602	-.003	.740	.016	.231
SEMA4	.722	.044	.837	-.038	.136
SEMA5	.627	-.024	.778	-.020	.147

Table B.4

Wetaskiwin Sample: Intra-Scale Reliabilities for Surgency

Morning Condition

```
                  RELIABILITY COEFFICIENTS                 5  ITEMS

                  ALPHA =  0.84798          STANDARDIZED ITEM ALPHA =  0.84931


                                                 MEANS                   STD DEV

                  1        SURM1   CHEERFUL       2.03243                 0.97615
                  2        SURM2   GLAD           2.02973                 0.98865
                  3        SURM3   JOYFUL         1.91081                 1.01754
                  4        SURM4   LIKE SMILING   1.80541                 1.06431
                  5        SURM5   WONDERFUL      1.78919                 1.11111

          # OF CASES =      370.0

STATISTICS FOR              MEAN         VARIANCE         STD DEV     # VARIABLES
        SCALE              9.56757       16.58214         4.07212             5

ITEM-TOTAL STATISTICS              SCALE         SCALE       CORRECTED
                                   MEAN        VARIANCE       ITEM-          SQUARED          ALPHA
                                  IF ITEM       IF ITEM       TOTAL          MULTIPLE        IF ITEM
                                  DELETED       DELETED     CORRELATION     CORRELATION      DELETED

                  SURM1           7.53514      11.32261       0.65557         0.46018        0.81753
                  SURM2           7.53784      11.31899       0.64460         0.42973        0.82017
                  SURM3           7.65676      10.69758       0.72852         0.54082        0.79768
                  SURM4           7.76216      10.92973       0.64225         0.42108        0.82094
                  SURM5           7.77838      10.81254       0.62082         0.39740        0.82794
```

Afternoon Condition

```
                  RELIABILITY COEFFICIENTS                 5  ITEMS

                  ALPHA =  0.90317          STANDARDIZED ITEM ALPHA =  0.90351


                                                 MEANS                   STD DEV

                  1.       SURA1   CHEERFUL       2.06720                 1.08073
                  2.       SURA2   GLAD           1.99194                 1.10008
                  3.       SURA3   JOYFUL         1.95699                 1.12711
                  4.       SURA4   LIKE SMILING   1.94355                 1.13010
                  5.       SURA5   WONDERFUL      1.97581                 1.14546

          # OF CASES =      372.0

STATISTICS FOR              MEAN         VARIANCE         STD DEV     # VARIABLES
        SCALE              9.93548       22.48100         4.74141             5

ITEM-TOTAL STATISTICS              SCALE         SCALE       CORRECTED
                                   MEAN        VARIANCE       ITEM-          SQUARED          ALPHA
                                  IF ITEM       IF ITEM       TOTAL          MULTIPLE        IF ITEM
                                  DELETED.      DELETED     CORRELATION     CORRELATION      DELETED

                  SURA1           7.86828      14.89150       0.79924         0.65686        0.87322
                  SURA2           7.94355      14.94829       0.74326         0.55925        0.88489
                  SURA3           7.97849      14.18822       0.82704         0.69650        0.86653
                  SURA4           7.99194      15.10238       0.69465         0.49665        0.89538
                  SURA5           7.95968      14.75039       0.72950         0.55082        0.88809
```

Table B.5
Wetaskiwin Sample: Intra-Scale Reliabilities for Sadness

Morning Condition

```
              RELIABILITY COEFFICIENTS                 5  ITEMS

              ALPHA =   0 78068           STANDARDIZED ITEM ALPHA =   0 78159


                                                MEANS                 STD DEV

              1        SADM1   LONELY          0 70270               1 00850
              2        SADM2   SAD             0 63514               0 88045
              3        SADM3   TRAPPED         0 58919               0 98182
              4        SADM4   UNWANTED        0 64324               0 99171
              5        SADM5   UPSET           0 71351               1 04068

       # OF CASES =      370 0

STATISTICS FOR                 MEAN        VARIANCE        STD DEV     # VARIABLES
          SCALE              3 18378       12 84418        3 58388             5

ITEM-TOTAL STATISTICS          SCALE         SCALE       CORRECTED
                               MEAN        VARIANCE        ITEM-         SQUARED          ALPHA
                              IF ITEM       IF ITEM        TOTAL         MULTIPLE        IF ITEM
                              DELETED       DELETED     CORRELATION    CORRELATION       DELETED

              SADM1           2 48108       8 42818       0 58025        0 37158         0 73141
              SADM2           2 54865       9 10115       0 55666        0 38749         0 74042
              SADM3           2 59459       9 01677       0 48579        0 27004         0 76273
              SADM4           2 54054       8 39537       0 60299        0 38230         0 72386
              SADM5           2 47027       8 41239       0 58473        0 37092         0 74067
```

Afternoon Condition

```
              RELIABILITY COEFFICIENTS                 5  ITEMS

              ALPHA =   0 76987           STANDARDIZED ITEM ALPHA =   0 77041


                                                MEANS                 STD DEV

              1        SADA1   LONELY          0 58871               0 95861
              2        SADA2   SAD             0 47581               0 90637
              3        SADA3   TRAPPED         0 47849               0 91826
              4        SADA4   UNWANTED        0 58333               1 00191
              5        SADA5   UPSET           0 69892               1 06181

       # OF CASES =      372 0

STATISTICS FOR                 MEAN        VARIANCE        STD DEV     # VARIABLES
          SCALE              2 82527       12 32788        3 51111             5

ITEM-TOTAL STATISTICS          SCALE         SCALE       CORRECTED
                               MEAN        VARIANCE        ITEM-         SQUARED          ALPHA
                              IF ITEM       IF ITEM        TOTAL         MULTIPLE        IF ITEM
                              DELETED       DELETED     CORRELATION    CORRELATION       DELETED

              SADA1           2 23656       8 49375       0 51293        0 30110         0.73745
              SADA2           2 34946       8 40046       0 58115        0 41348         0 71231
              SADA3           2 34677       8 97646       0 45584        0 25506         0 75538
              SADA4           2 24194       7 90896       0 60602        0 38344         0 70445
              SADA5           2 12634       7 93817       0 54523        0 34559         0 72753
```

Table B.6

Wetaskiwin Sample: Intra-Scale Reliabilities for Aggression

Morning Condition

```
RELIABILITY COEFFICIENTS                 5  ITEMS

ALPHA =   0.69640          STANDARDIZED ITEM ALPHA =  0.69886


                                     MEANS                 STD DEV

1       AGGM1   BAD TEMPERED      0.37297                0.66387
2       AGGM2   BOSSY             0.39730                0.72246
3       AGGM3   FURIOUS           0.42973                0.77332
4       AGGM4   LIKE HITTING      0.60541                0.96276
5       AGGM5   MEAN              0.48919                0.82714

  # OF CASES =      370.0

STATISTICS FOR           MEAN        VARIANCE       STD DEV    # VARIABLES
        SCALE          2.29459        7.24902       2.69240          5

ITEM-TOTAL STATISTICS         SCALE         SCALE      CORRECTED
                               MEAN       VARIANCE       ITEM-         SQUARED          ALPHA
                              IF ITEM      IF ITEM       TOTAL         MULTIPLE        IF ITEM
                              DELETED      DELETED    CORRELATION    CORRELATION       DELETED

                AGGM1         1.92162      5.40024       0.45554        0.22892         0.64846
                AGGM2         1.89730      5.44200       0.38126        0.15728         0.67463
                AGGM3         1.86486      5.23914       0.39881        0.17941         0.66849
                AGGM4         1.68919      4.26526       0.49104        0.28446         0.63494
                AGGM5         1.80541      4.59076       0.55695        0.31649         0.59981
```

Afternoon Condition

```
RELIABILITY COEFFICIENTS                 5  ITEMS

ALPHA =   0.84821          STANDARDIZED ITEM ALPHA =  0.85091


                                     MEANS                 STD DEV

1       AGGA1   BAD TEMPERED      0.51613                0.88759
2       AGGA2   BOSSY             0.43011                0.81964
3       AGGA3   FURIOUS           0.62634                0.98924
4       AGGA4   LIKE HITTING      0.76882                1.12329
5       AGGA5   MEAN              0.61290                0.99087

  # OF CASES =      372.0

STATISTICS FOR           MEAN        VARIANCE       STD DEV    # VARIABLES
        SCALE          2.95430       14.62055       3.82368          5

ITEM-TOTAL STATISTICS         SCALE         SCALE      CORRECTED
                               MEAN       VARIANCE       ITEM-         SQUARED          ALPHA
                              IF ITEM      IF ITEM       TOTAL         MULTIPLE        IF ITEM
                              DELETED      DELETED    CORRELATION    CORRELATION       DELETED

                AGGA1         2.43817      9.96652       0.67904        0.47138         0.81241
                AGGA2         2.52419     10.71909       0.60185        0.38200         0.83231
                AGGA3         2.32796      9.71426       0.63694        0.41239         0.82262
                AGGA4         2.18548      8.94394       0.65710        0.45740         0.82084
                AGGA5         2.34140      9.21737       0.73488        0.54514         0.79568
```

Table B.7

Wetaskiwin Sample: Intra-Scale Reliabilities for Mastery/Self-Esteem

Morning Condition

```
RELIABILITY COEFFICIENTS                5  ITEMS

ALPHA =   0 82490          STANDARDIZED ITEM ALPHA =   0 82414


                                        MEANS                 STD DEV

    1        SEMM1    BRAVE             1 79730               1 00108
    2        SEMM2    HANDSOME PRETTY   1 48919               1 07252
    3        SEMM3    POWERFUL          1 33243               1 08963
    4        SEMM4    STRONG            1 60000               1 05534
    5        SEMM5    TOUGH             1 37838               1 07324

      # OF CASES =      370 0

STATISTICS FOR            MEAN        VARIANCE        STD DEV     # VARIABLES
         SCALE          7 59730       16 54471        4 06752          5

ITEM-TOTAL STATISTICS             SCALE         SCALE       CORRECTED
                                  MEAN        VARIANCE        ITEM-         SQUARED          ALPHA
                                 IF ITEM       IF ITEM        TOTAL         MULTIPLE        IF ITEM
                                 DELETED       DELETED     CORRELATION    CORRELATION       DELETED

                  SEMM1          5 80000      11 87859       0 53097        0 28594         0 81426
                  SEMM2          6 10811      11 93950       0 48613        0 21822         0 83345
                  SEMM3          6 26486      10 34700       0 71476        0 53843         0 76128
                  SEMM4          5 99730      10 42005       0 72547        0 55119         0 75860
                  SEMM5          6 21892      10 67552       0 67263        0 49944         0 77446
```

Afternoon Condition

```
RELIABILITY COEFFICIENTS                5  ITEMS

ALPHA =   0 84524          STANDARDIZED ITEM ALPHA =   0 84524


                                        MEANS                 STD DEV

    1        SEMA1    BRAVE             1 80376               1 06231
    2        SEMA2    HANDSOME PRETTY   1 69892               1 09185
    3        SEMA3    POWERFUL          1 61828               1 12290
    4        SEMA4    STRONG            1 79301               1 07280
    5        SEMA5    TOUGH             1 52151               1 16650

      # OF CASES =      372 0

STATISTICS FOR            MEAN        VARIANCE        STD DEV     # VARIABLES
         SCALE          8 43548       18 81783        4 33795          5

ITEM-TOTAL STATISTICS             SCALE         SCALE       CORRECTED
                                  MEAN        VARIANCE        ITEM-         SQUARED          ALPHA
                                 IF ITEM       IF ITEM        TOTAL         MULTIPLE        IF ITEM
                                 DELETED       DELETED     CORRELATION    CORRELATION       DELETED

                  SEMA1          6 63172      12 75080       0 65086        0 43380         0 81419
                  SEMA2          6 73656      13 93580       0 45266        0 22377         0 86440
                  SEMA3          6 81720      12 14978       0 69078        0 51173         0 80301
                  SEMA4          6 64247      11 83382       0 77340        0 61732         0 78116
                  SEMA5          6 91398      11 77895       0 70947        0 58112         0 79752
```

APPENDIX C

ONEWAY ANOVAS AND MULTIPLE COMPARISONS FOR SCHOOLS

Table C.1

ONEWAY ANALYSIS OF VARIANCE AND MULTIPLE COMPARISONS FOR SCHOOL ON SURGENCY[a]

SCHOOL/GRADE	N	MEAN[b]	STANDARD DEVIATION	ANOVA F PROBABILITY	MULTIPLE COMPARISON TESTS (P ≤ .05)[c] LEAST SIGNIFICANT DIFFERENCE		DUNCANS'S[d]		T-TEST
Grades 3-6	372								N/M
Morning	370	9.5676	4.0721	.01	McMurdo				(p=036)
Norwood	75	9.4933	4.3196		(7.9464)		M		M/C
Centennial	126	9.9841	3.8905			Norwood		N	(p=.002)
Parkdale	113	9.9558	3.9897		Norwood				P/M
McMurdo	56	7.9464	3.9928		(9.4933)	Parkdale		P	(p=.003)
(no grade 3)						(9.9558)			M/P,C
						Centennial		C	(p=.001)
						(9.9841)			
Grades 4-6	316								
Morning	314	9.3631	3.9928	.0228	McMurdo		M		M/C
Norwood	54	9.1111	4.5085		(7.9464)				(p=.004)
Centennial	104	9.8654	3.8593			Norwood	N	N	P/M
Parkdale	100	9.7700	4.0047		Norwood	Parkdale		P	(p=.007)
McMurdo	56	7.9464	3.9928		(9.1111)	(9.7700)			M/PC
						Centennial		C	(p=.002)
						(9.8654)			
Grade 3 Females	23								
Morning	23	10.8696	3.4812	.1255					P/C
Norwood	7	11.4286	2.9358						(p=.037)
Centennial	10	9.3000	3.9735			N.S.	N.S.		N,P/C
Parkdale	6	12.8333	2.1370						(p=.05)
(no McMurdo)									
Grade 4 Females	55								
Afternoon	55	10.5818	4.7128	.141					N/C
Norwood	10	12.2000	3.9101						(p=.05)
Centennial	19	9.1053	5.6361			N.S.	N.S.		M/C
Parkdale	14	9.7857	5.0410						(p=.023)
McMurdo	12	12.5000	1.8829						N,M/C
									(p=.035)
Grade 5 Females	47								
Morning	47	8.8298	4.2851	.05	McMurdo		M		M/C
Norwood	7	9.5714	5.0943		(6.3333)	Parkdale	P	P	(p=.007)
Centennial	11	11.0909	3.3001		Parkdale	Norwood	N	N	N,M/C
Parkdale	17	8.8235	3.9248		(8.8235)	Centennial		C	(p=.05)
McMurdo	12	6.3333	4.2498		Norwood	(11.0909)			N,P,M/C
					(9.5714)				(p=.038)
Afternoon	47	11.4894	3.7986	.004	Centennial		C		N/M
Norwood	7	14.2857	1.4960		(8.3636)				(p=.05)
Centennial	11	8.3636	5.5547		Parkdale	Parkdale		P	N/C
Parkdale	17	11.6471	2.6912		(11.6471)	McMurdo		M	(p=.001)
McMurdo	12	12.5000	2.1532			(12.5000)			N/P
						Norwood		N	(p=.006)
						(14.2857)			M/C
									(p=.005)
									P/C
									(p=.016)
									N,P/C
									(p=.001)
									N,M/C
									(p=.0001)
									N,P,M/C
									(p=.0001)

Grade 6 Females	56							
Morning	54	9.9630	4.0139	.0264			M	N/C (p=.03) N/P (p=.009) P/M (p=.027) M/C (p=.038) N,M/C (p=.01) N,P,M/C (p=.05)
Norwood	11	7.8182	3.0271			N.S.	N N	
Centennial	20	10.9000	4.4236				C C	
Parkdale	17	11.2353	3.2119				P	
McMurdo	6	7.1667	4.0702					
Afternoon	56	10.3571	4.6179	.0284			M	M/C (p=.006) M/P (p=.043) N,M/C (p=.005) N,P,M/C (p=.005)
Norwood	11	10.1818	4.8336		McMurdo (6.1429)			
Centennial	20	12.1000	3.2911					
Parkdale	18	10.1667	5.1478		Parkdale (10.1667)	Parkdale	P	
McMurdo	7	6.1429	4.0178		Norwood (10.1818)	Norwood Centennial (12.1000)	N C	
Grade 5 Males	51							
Afternoon	50	9.0800	4.7973	.1243				P/C (p=.021) N,P,M/C (.038)
Norwood	9	8.7778	6.4571					
Centennial	15	6.8000	4.8137			N.S.	N.S.	
Parkdale	18	10.5000	3.6340					
McMurdo	8	10.5000	4.0356					

a Data are presented for only those analyses which have at least one significant difference of p ≤.05.

b Scale means have a possible range from 0 (no mood items were applicable) to 15

c Left-column schools are significantly different from right-column schools

d Schools: N=Norwood, C=Centennial, P=Parkdale, M=McMurdo

Table C.2

ONEWAY ANALYSIS OF VARIANCE AND MULTIPLE COMPARISONS FOR SCHOOL ON SADNESS[a]

SCHOOL/GRADES	N	MEAN[b]	STANDARD DEVIATION	ANOVA F PROBABILITY	MULTIPLE COMPARISON TESTS ($p \le .05$)[c]		
					LEAST SIG. DIFF.	DUNCAN'S[d]	T-TEST
Grade 4 Females	55						
Morning	55	3.4270	3.5635	.1492	N.S.	N.S.	N/C p=.034 M/C p=.036 N,M/C p=.018 N,P,M/C p=.041
Norwood	10	2.2000	2.5298				
Centennial	19	4.8421	3.7898				
Parkdale	14	3.5000	4.2016				
McMurdo	12	2.3333	2.5702				
Afternoon	55	3.8909	4.2586	.2821	N.S.	N.S.	N/C p=.029
Norwood	10	1.8000	2.6162				
Centennial	19	5.0526	4.9941				
Parkdale	14	3.7143	3.8316				
McMurdo	12	4.0000	4.3485				
Grade 5 Females	47						
Afternoon	47	2.2766	3.3925	.1363	N.S.	N.S.	P/C p=.022 N,P/C p=.043 N,P,M/C p=.037
Norwood	7	2.1429	2.7343				
Centennial	11	4.2727	4.6495				
Parkdale	17	1.2353	2.4882				
McMurdo	12	2.0000	3.1042				
Grade 5 Males	51						
Morning	51	3.5686	4.2060	.2157	N.S.	M (1.88) C C (2.87) P P (3.74) N (5.89)	N/M p=.05
Norwood	9	5.8889	4.9861				
Centennial	15	2.8667	3.9073				
Parkdale	19	3.7368	4.4826				
McMurdo	8	1.8750	2.1002				

a Data are presented for only those analyses which have at least one significant difference of $p \le .05$.

b Scale means have a possible range from 0 (no mood items were applicable) to 15

c Left-column schools are significantly different from right-column schools

d Schools: N=Norwood, C=Centennial, P=Parkdale, M=McMurdo

Table C.3

ONEWAY ANALYSIS OF VARIANCE AND MULTIPLE COMPARISONS FOR SCHOOL ON AGGRESSION[a]

SCHOOL/GRADE	N	MEAN[b]	STANDARD DEVIATION	ANOVA F PROBABILITY	MULTIPLE COMPARISON TESTS (p≤.05)[c] LEAST SIGNIFICANT DIFFERENCE	DUNCAN'S[d]	T-TEST
Grades 3-6	372						
Morning	370	2.2946	2.6924	.0497	N.S.	P (1.88) M (1.91) C C (2.52) N (2.84)	N/M (p=.033) N/P (p=.015) N,C/P,M (p=.005)
Norwood	75	2.8400	2.7756				
Centennial	126	2.5159	3.0166				
Parkdale	113	1.8761	2.4132				
McMurdo (no grade 3)	56	1.9107	2.1682				
Afternoon	372	2.9543	3.8237	.2025	N.S.	N.S.	M/C (p=.05) N,C/P,M (p=.032)
Norwood	75	3.3200	4.2304				
Centennial	127	3.3150	4.1818				
Parkdale	113	2.6903	3.3087				
McMurdo (no grade 3)	57	2.1930	3.2811				
Grades 4-6	316						
Morning	314	2.3822	2.7480	.0104	Parkdale (1.88) McMurdo Centennial (1.91) Centennial Norwood (2.69) (3.20)	P M C C N	N/M (p=.011) N/P (p=.006) P/C (p=.036) N/C,P (p=.045) N,C/P,M (p=.001)
Norwood	54	3.2037	2.9992				
Centennial	104	2.6923	3.0595				
Parkdale	100	1.8800	2.4132				
McMurdo	56	1.9107	2.1682				
Afternoon	316	2.8513	3.8064	.2394	N.S.	N.S.	M/C (.05)
Norwood	54	3.0741	4.2994				
Centennial	105	3.3524	4.2516				
Parkdale	100	2.5800	3.2417				
McMurdo	57	2.1930	3.2811				
Grade 4 Females	55						
Afternoon	55	2.6545	3.4114	.0536	N.S.	M (1.00) P P (2.21) N N C (2.30) (4.21)	M/C (p=.009) N,P/C (p=.05) N,M/C (p=.016) N,C/P,M (p=.046) N,P,M/C (p=.014)
Norwood	10	2.3000	2.9458				
Centennial	19	4.2105	4.5041				
Parkdale	14	2.2143	2.3916				
McMurdo	12	1.0000	1.5954				
Grade 5 Females	47						
Afternoon	47	1.3617	2.4596	.0105	Norwood (.1429) Parkdale Parkdale (.7647) McMurdo McMurdo (.8333) Centennial (3.6364)	N P M C	N/C (p=.024) P/C (p=.004) M/C (p=.009) N,P/C (p=.001) N,M/C (p=.002) N,P,M/C (p=.001)
Norwood	7	.1429	.3780				
Centennial	11	3.6364	4.3422				
Parkdale	17	.7647	1.2515				
McMurdo	12	.8333	2.0375				

Grade 6 Females	56								
Morning	54	1.5926	2.2780	.1382		N.S.	N.S.		N/P (p=.043) N,C/P,M (p=.033)
Norwood	11	2.5455	2.7700						
Centennial	20	2.0000	2.7530						
Parkdale	17	.7647	1.0914						
McMurdo	6	.8333	1.1690						
Grade 4 Males	50								
Morning	50	2.7600	3.0004	.0158	McMurdo (.8333) Parkdale (1.54) Norwood (2.58)	Parkdale Norwood Centennial (4.32)	M P N	N C	P/C (p=.007) M/C (p=.001) N,P/C (p=.023) N,M/C (p=.009) N,P,M/C (p=.005)
Norwood	12	2.5833	2.7784						
Centennial	19	4.3158	3.5127						
Parkdale	13	1.5385	1.8536						
McMurdo	6	.8333	.9832						
Grade 5 Males	51								
Morning	51	3.0784	3.2793	.0048	Centennial (1.93) McMurdo (2.50) Parkdale (2.63)	Norwood (6.44)	C M P	N	N/M (p=.027) N/C (p=.010) N/P (p=.024) N,P/C (p=.015) N,M/C (p=.022) N,P,M/C (p=.037)
Norwood	9	6.4444	3.9721						
Centennial	15	1.9333	2.6040						
Parkdale	19	2.6316	2.8326						
McMurdo	8	2.5000	2.5071						
Grade 6 Males	57								
Afternoon	57	3.1930	4.2276	.0282	Centennial (1.55) McMurdo (3.25) Parkdale (3.70)	McMurdo Parkdale Norwood (7.60)	C M P	N	N/P (p=.05) N/C (p=.004) N/M (p=.046) P/M (p=.003) N,P/C (p=.007) N,M/C (p=.007)
Norwood	5	7.6000	6.9857						
Centennial	20	1.5500	3.5463						
Parkdale	20	3.7000	3.7989						
McMurdo	12	3.2500	3.5194						

a Data are presented for only those analyses which have at least one significant difference of p ≤.05.

b Scale means have a possible range from 0 (no mood items were applicable) to 15

c Left-column schools are significantly different from right-column schools

d Schools: N=Norwood, C=Centennial, P=Parkdale, M=McMurdo

Table C.4

ONEWAY ANALYSIS OF VARIANCE AND MULTIPLE COMPARISONS FOR SCHOOL

ON MASTERY/SELF-ESTEEM[a]

SCHOOL/GRADE	N	MEAN[b]	STANDARD DEVIATION	ANOVA F PROBABILITY	MULTIPLE COMPARISON TESTS (p≤.05)[c]				
					LEAST SIGNIFICANT DIFFERENCE		DUNCAN'S[d]		T-TEST
Grades 3-6	372								
Morning	370	7.5973	4.0675	.0079	McMurdo		M		N/C
Norwood	75	8.6000	4.3589		(6.214)				(p=.05)
Centennial	126	7.3968	4.2785		Centennial	Centennial	C	C	N/M
Parkdale	113	7.8407	3.5319		(7.397)				(p=.001)
McMurdo	56	6.2143	3.8599			Parkdale		P	P/M
(no grade 3)						(7.841)			(p=.009)
						Norwood		N	C,P/M
						(8.600)			(p=.017)
									N,C/P,M
									(p=.028)
Afternoon	372	8.4355	4.3380	.0185	McMurdo		M		N/M
Norwood	75	9.5867	4.2334		(7.421)				(p=.003)
Centennial	127	8.0079	4.5364		Centennial	Centennial	C		N/C
Parkdale	113	8.6637	4.1760		(8.008)				(p=.014)
McMurdo	57	7.4211	4.0574		Parkdale	Parkdale	P	P	
(no grade 3)					(8.664)				
						Norwood		N	
						(9.587)			
Grades 4-6	316								
Morning	314	7.4299	4.0004	.0129	McMurdo		M		N/C
Norwood	54	8.6852	4.3819		(6.214)				(p=.038)
Centennial	104	7.3077	4.1713		Centennial	Centennial	C		N/M
Parkdale	100	7.5600	3.4941		(7.308)				(p=.002)
McMurdo	56	6.2143	3.8599		Parkdale	Parkdale	P	P	P/M
					(7.560)				(p=.033)
						Norwood		N	C,P/M
						(8.685)			(p=.039)
									N,C/P,M
									(p=.021)
Afternoon	316	8.4177	4.2325	.0101	McMurdo		M		N/C
Norwood	54	10.0000	3.8851		(7.421)				(p=.007)
Centennial	105	8.1238	4.4607		Centennial		C		N/P
Parkdale	100	8.4400	4.0833		(8.124)				(p=.021)
McMurdo	57	7.4211	4.0574		Parkdale	Parkdale	P		N/M
					(8.440)				(p=.001)
						Norwood		N	N/C,P
						(10.000)			(p=.006)
									N,C/P,M
									(p=.019)
Grade 3 Females	23								
Morning	23	6.2174	4.1665	.0831			C		P/C
Norwood	7	6.5714	3.5051				(4.30)		(p=.048)
Centennial	10	4.3000	3.9455		N.S.		N	N	N,P/C
Parkdale	6	9.0000	4.0988				(6.57)		(p=.048)
(no McMurdo)								P	
								(9.00)	
Afternoon	23	6.5652	4.9343	.0211	Centennial		C		N,C/P
Norwood	7	6.0000	5.0332		(4.30)				(p=.021)
Centennial	10	4.3000	3.5917		Norwood	Norwood	N		N,P/C
Parkdale	6	11.0000	4.3818		(6.00)	(6.00)			(p=.025)
(No McMurdo)						Parkdale		P	P/C
						(11.00)			(p=.012)

Grade 4 Females	55									
Afternoon	55	6.6182	3.9086	.0816			P			N/C
Norwood	10	9.3000	2.1108				(5.43)			(p=.016)
Centennial	19	5.9474	4.8588		N.S.		C			N/P
Parkdale	14	5.4286	3.2984				(5.95)			(p=.002)
McMurdo	12	6.8333	3.2706				M		M	N/M
							(6.83)			(p=.046)
									N	
									(9.30)	
Grade 5 Females	47									
Morning	47	6.0851	3.9167	.0013	McMurdo		M			N/P
Norwood	7	9.2857	4.6803		(3.33)					(p=.014)
Centennial	11	8.0909	3.7270		Parkdale	Parkdale	P	P		N/M
Parkdale	17	5.4118	2.9381		(5.4118)					(p=.015)
McMurdo	12	3.3333	2.7414			Centennial		C	C	P/C
						(8.09)				(p=.05)
						Norwood			N	N,C/P,M
						(9.29)				(p=.002)
Afternoon	47	6.9149	3.6525	.0091	McMurdo		M			N/C
Norwood	7	11.0000	2.2361		(5.667)					(p=.002)
Centennial	11	6.1818	3.2193		Centennial		C			N/P
Parkdale	17	6.5882	3.3552		(6.182)					(p=.002)
McMurdo	12	5.6667	3.7739		Parkdale		P			N/M
					(6.588)	Norwood			N	(p=.001)
						(11.000)				N,P/C
										(p=.034)
Grade 6 Females	56									
Morning	54	6.1667	3.6794	.2815						P/M
Norwood	11	6.6364	4.2255							(p=.032)
Centennial	20	5.7000	4.2065		N.S.		N.S.			
Parkdale	17	7.1765	2.6980							
McMurdo	6	4.0000	2.6077							
Afternoon	56	7.7857	4.2371	.1812			M			N/M
Norwood	11	8.8182	4.3086				(4.57)			(p=.04)
Centennial	20	8.0000	4.2674		N.S.		C		C	P/M
Parkdale	18	8.1667	3.6015				(8.00)			(p=.05)
McMurdo	7	4.5714	4.9618				P		P	
							(8.17)			
									N	
									(8.82)	

a Data are presented for only those analyses which have at least one significant difference of $p \leq .05$.

b Scale means have a possible range from 0 (no mood items were applicable) to 15

c Left-column schools are significantly different from right-column schools

d Schools: N=Norwood, C=Centennial, P=Parkdale, M=McMurdo

APPENDIX D

PEARSON CORRELATION COEFFICIENTS: EDMONTON AND WETASKIWIN

Table D.1

Pearson Correlation Coefficients: Exam

	SURE1	SURE2	SURE3	SURE4	SURE5	SADE1	SADE2	SADE3	SADE4	SADE5
SURE1	1.00000	0.64868	0.73564	0.62743	0.58338	-0.14940	-0.23698	-0.20914	-0.14156	-0.34836
SURE2	0.64868	1.00000	0.66179	0.59966	0.58936	-0.13264	-0.24133	-0.25968	-0.17158	-0.32551
SURE3	0.73564	0.66179	1.00000	0.67037	0.61008	-0.12214	-0.23195	-0.20366	-0.16490	-0.32418
SURE4	0.62743	0.59966	0.67037	1.00000	0.57769	-0.17626	-0.26647	-0.16990	-0.09956	-0.28957
SURE5	0.58338	0.58936	0.61008	0.57769	1.00000	-0.10545	-0.24317	-0.22846	-0.12091	-0.31387
SADE1	-0.14940	-0.13264	-0.12214	-0.17626	-0.10545	1.00000	0.44092	0.24635	0.37291	0.24696
SADE2	-0.23698	-0.24133	-0.23195	-0.26647	-0.24317	0.44092	1.00000	0.33374	0.30270	0.47395
SADE3	-0.20914	-0.25968	-0.20366	-0.16990	-0.22846	0.24635	0.33374	1.00000	0.34774	0.37064
SADE4	-0.14156	-0.17158	-0.16490	-0.09956	-0.12091	0.37291	0.30270	0.34774	1.00000	0.29552
SADE5	-0.34836	-0.32551	-0.32418	-0.28957	-0.31387	0.24696	0.47395	0.37064	0.29552	1.00000
AGGE1	-0.33109	-0.34345	-0.32787	-0.30350	-0.22945	0.10555	0.27072	0.29468	0.13623	0.32618
AGGE2	-0.19035	-0.18519	-0.16205	-0.14958	-0.07565	0.09897	0.17262	0.21978	0.12942	0.18786
AGGE3	-0.31739	-0.32608	-0.30861	-0.28858	-0.24488	0.13368	0.27539	0.25107	0.17385	0.37302
AGGE4	-0.33182	-0.33227	-0.35804	-0.32652	-0.24253	0.19010	0.28511	0.29096	0.21277	0.38186
AGGE5	-0.28973	-0.34769	-0.30448	-0.31942	-0.24520	0.19542	0.29556	0.28067	0.22221	0.37789
SEME1	0.31715	0.37268	0.34365	0.29882	0.37340	-0.02188	-0.07069	0.01453	0.02981	0.00293
SEME2	0.31805	0.33913	0.33766	0.32341	0.35412	-0.04599	0.00499	0.00769	-0.02040	-0.01386
SEME3	0.10169	0.13526	0.12545	0.11358	0.21160	-0.00542	-0.02347	0.04938	-0.00532	-0.02207
SEME4	0.17893	0.23155	0.16321	0.20484	0.23881	0.00516	-0.01465	0.03093	0.06227	0.00717
SEME5	0.07792	0.10049	0.10792	0.12886	0.15514	0.05631	0.03914	0.09123	0.13135	0.07711

	AGGE1	AGGE2	AGGE3	AGGE4	AGGE5	SEME1	SEME2	SEME3	SEME4	SEME5
SURE1	-0.33109	-0.19035	-0.31739	-0.33182	-0.28973	0.31715	0.31805	0.10169	0.17893	0.07792
SURE2	-0.34345	-0.18519	-0.32608	-0.33227	-0.34769	0.37268	0.33913	0.13526	0.23155	0.10049
SURE3	-0.32787	-0.16205	-0.30861	-0.35804	-0.30448	0.34365	0.33766	0.12545	0.16321	0.10792
SURE4	-0.30350	-0.14958	-0.28858	-0.32652	-0.31942	0.29882	0.32341	0.11358	0.20484	0.12886
SURE5	-0.22945	-0.07565	-0.24488	-0.24253	-0.24520	0.37340	0.35412	0.21160	0.23881	0.15514
SADE1	0.10555	0.09897	0.13368	0.19010	0.19542	-0.02188	-0.04599	-0.00542	0.00516	0.05631
SADE2	0.27072	0.17262	0.27539	0.28511	0.29556	-0.07069	0.00499	-0.02347	-0.01465	0.03914
SADE3	0.29468	0.21978	0.25107	0.29096	0.28067	0.01453	0.00769	0.04938	0.03093	0.09123
SADE4	0.13623	0.12942	0.17385	0.21277	0.22221	0.02981	-0.02040	-0.00532	0.06227	0.13135
SADE5	0.32618	0.18786	0.37302	0.38186	0.37789	0.00293	-0.01386	-0.02207	0.00717	0.07711
AGGE1	1.00000	0.44305	0.53643	0.49479	0.47500	0.02245	-0.03110	0.10584	0.08616	0.13452
AGGE2	0.44305	1.00000	0.41535	0.46963	0.47653	0.12699	0.08529	0.26112	0.22263	0.25918
AGGE3	0.53643	0.41535	1.00000	0.58068	0.53739	0.07579	-0.05473	0.18506	0.12081	0.17585
AGGE4	0.49479	0.46963	0.58068	1.00000	0.65695	0.00405	-0.01892	0.21179	0.17097	0.25882
AGGE5	0.47500	0.47653	0.53739	0.65695	1.00000	0.05219	-0.00802	0.22252	0.19407	0.25850
SEME1	0.02245	0.12699	0.07579	0.00405	0.05219	1.00000	0.44036	0.45914	0.48850	0.39737
SEME2	-0.03110	0.08529	-0.05473	-0.01892	-0.00602	0.44036	1.00000	0.32899	0.34749	0.34918
SEME3	0.10584	0.26112	0.18506	0.21179	0.22252	0.45914	0.32899	1.00000	0.55073	0.52863
SEME4	0.08616	0.22263	0.12081	0.17097	0.19407	0.48850	0.34749	0.55073	1.00000	0.58586
SEME5	0.13452	0.25918	0.17585	0.25882	0.25850	0.39737	0.34918	0.52863	0.58586	1.00000

Table D.2
Pearson Correlation Coefficients: Film

	SURF1	SURF2	SURF3	SURF4	SURF5	SADF1	SADF2	SADF3	SADF4	SADF5
SURF1	1.00000	0.58133	0.67368	0.47260	0.55955	-0.06292	-0.24280	-0.11983	-0.18877	-0.29215
SURF2	0.58133	1.00000	0.64757	0.53483	0.56848	-0.07847	-0.21796	-0.14452	-0.10117	-0.23806
SURF3	0.67368	0.64757	1.00000	0.55094	0.56757	-0.08148	-0.24409	-0.10304	-0.18325	-0.30403
SURF4	0.47260	0.53483	0.55094	1.00000	0.54007	-0.16905	-0.19298	-0.11584	-0.08610	-0.24992
SURF5	0.55955	0.56848	0.56757	0.54007	1.00000	-0.15423	-0.33938	-0.22222	-0.18149	-0.37825
SADF1	-0.06292	-0.07847	-0.08148	-0.16905	-0.15423	1.00000	0.42116	0.31554	0.33736	0.30083
SADF2	-0.24280	-0.21796	-0.24409	-0.19298	-0.33938	0.42116	1.00000	0.31736	0.42337	0.53007
SADF3	-0.11983	-0.14452	-0.10304	-0.11584	-0.22222	0.31554	0.31736	1.00000	0.26334	0.18788
SADF4	-0.18877	-0.10117	-0.18325	-0.08610	-0.18149	0.33736	0.42337	0.26334	1.00000	0.38593
SADF5	-0.29215	-0.23806	-0.30403	-0.24992	-0.37825	0.30083	0.53007	0.18788	0.38593	1.00000
AGGF1	-0.38507	-0.31791	-0.28883	-0.24887	-0.26162	0.10001	0.19565	0.21069	0.16106	0.33455
AGGF2	-0.19949	-0.16788	-0.16747	-0.14788	-0.08030	0.11522	0.16589	0.18540	0.16087	0.20932
AGGF3	-0.23790	-0.21564	-0.19813	-0.14323	-0.18278	0.19012	0.18449	0.22165	0.24848	0.31134
AGGF4	-0.25793	-0.22019	-0.24392	-0.23259	-0.27673	0.15988	0.18186	0.31044	0.18016	0.33251
AGGF5	-0.25779	-0.24471	-0.25338	-0.25787	-0.19964	0.15029	0.17728	0.16426	0.15769	0.29821
SEMF1	0.25127	0.27495	0.27895	0.23536	0.23346	0.05428	-0.05430	0.04890	0.09533	-0.00941
SEMF2	0.25839	0.25697	0.28948	0.23495	0.30980	-0.05643	-0.03077	0.03235	0.03861	0.01280
SEMF3	0.09470	0.13687	0.11499	0.07971	0.17678	0.08083	-0.00951	0.03715	0.07498	0.07009
SEMF4	0.12724	0.13956	0.15084	0.09011	0.12742	0.03439	-0.03614	0.00254	0.04583	0.02199
SEMF5	0.08529	0.07715	0.09736	0.07713	0.07302	0.02112	0.00416	0.03198	0.12780	0.08624

	AGGF1	AGGF2	AGGF3	AGGF4	AGGF5	SEMF1	SEMF2	SEMF3	SEMF4	SEMF5
SURF1	-0.38507	-0.19949	-0.23790	-0.25793	-0.25779	0.25127	0.25839	0.09470	0.12724	0.08529
SURF2	-0.31791	-0.16788	-0.21564	-0.22019	-0.24471	0.27495	0.25697	0.13687	0.13956	0.07715
SURF3	-0.28883	-0.16747	-0.19813	-0.24392	-0.25338	0.27895	0.28948	0.11499	0.15084	0.09736
SURF4	-0.24887	-0.14788	-0.14323	-0.23259	-0.25787	0.23536	0.23495	0.07971	0.09011	0.07713
SURF5	-0.26162	-0.08030	-0.18278	-0.27673	-0.19964	0.23346	0.30980	0.17678	0.12742	0.07302
SADF1	0.10001	0.11522	0.19012	0.15988	0.15029	0.05428	-0.05643	0.08083	0.03439	0.02112
SADF2	0.19565	0.16589	0.18449	0.18186	0.17728	-0.05430	-0.03077	-0.00951	-0.03614	0.00416
SADF3	0.21069	0.18540	0.22165	0.31044	0.16426	0.04890	0.03235	0.03715	0.00254	0.03198
SADF4	0.16106	0.16087	0.24848	0.18016	0.15769	0.09533	0.03861	0.07498	0.04583	0.12780
SADF5	0.33455	0.20932	0.31134	0.33251	0.29821	-0.00941	0.01280	0.07009	0.02199	0.08624
AGGF1	1.00000	0.42507	0.40397	0.47219	0.48813	0.08701	-0.04855	0.18494	0.10555	0.20571
AGGF2	0.42507	1.00000	0.42183	0.37780	0.41370	0.14174	0.03058	0.21433	0.16612	0.27543
AGGF3	0.40397	0.42183	1.00000	0.33451	0.41061	0.08766	-0.02046	0.17903	0.13055	0.21874
AGGF4	0.47219	0.37780	0.33451	1.00000	0.53138	0.10388	-0.01325	0.22342	0.21894	0.28125
AGGF5	0.48813	0.41370	0.41061	0.53138	1.00000	0.11225	-0.01127	0.30486	0.20493	0.33828
SEMF1	0.08701	0.14174	0.08766	0.10388	0.11225	1.00000	0.35250	0.51213	0.53199	0.46767
SEMF2	-0.04855	0.03058	-0.02046	-0.01325	-0.01127	0.35250	1.00000	0.27182	0.32181	0.28635
SEMF3	0.18494	0.21433	0.17903	0.22342	0.30486	0.51213	0.27182	1.00000	0.66656	0.65110
SEMF4	0.10555	0.16612	0.13055	0.21894	0.20493	0.53199	0.32181	0.66656	1.00000	0.65467
SEMF5	0.20571	0.27543	0.21874	0.28125	0.33828	0.46767	0.28635	0.65110	0.65467	1.00000

Table D.3

Pearson Correlation Coefficients: Morning

	SURM1	SURM2	SURM3	SURM4	SURM5	SADM1	SADM2	SADM3	SADM4	SADM5
SURM1	1 00000	0 54378	0 62774	0 46781	0 47857	-0 05900	-0 15899	-0 07656	-0 10559	-0 19358
SURM2	0 54378	1 00000	0 57646	0 51805	0 44980	-0 06178	-0 19880	-0 11584	-0 05825	-0 18398
SURM3	0 62774	0 57646	1 00000	0 55199	0 55143	-0 08929	-0 16136	-0 16973	-0 11487	-0 23150
SURM4	0 46781	0 51805	0 55199	1 00000	0 53356	-0 10959	-0 11704	-0 13120	-0 03001	-0 20217
SURM5	0 47857	0 44980	0 55143	0 53356	1 00000	-0 16976	-0 27498	-0 18646	-0 17174	-0 37581
SADM1	-0 05900	-0 06178	-0 08929	-0 10959	-0 16976	1 00000	0 46352	0 37727	0 52503	0 37052
SADM2	-0 15899	-0 19880	-0 16136	-0 11704	-0 27498	0 46352	1 00000	0 27387	0 37444	0 55525
SADM3	-0 07656	-0 11584	-0 16973	-0 13120	-0 18646	0 37727	0 27387	1 00000	0 47542	0 35139
SADM4	-0 10559	-0 05825	-0 11487	-0 03001	-0 17174	0 52503	0 37444	0 47542	1 00000	0 40488
SADM5	-0 19358	-0 18398	-0 23150	-0 20217	-0 37581	0 37052	0 55525	0 35139	0 40488	1 00000
AGGM1	-0 24461	-0 16976	-0 27165	-0 24610	-0 23854	0 20661	0 23723	0 28991	0 18213	0 34739
AGGM2	-0 15281	-0 05073	-0 06226	-0 06130	-0 10469	0 15139	0 12072	0 24605	0 27401	0 18784
AGGM3	-0 21237	-0 08765	-0 08892	-0 09897	-0 17183	0 26503	0 21061	0 26889	0 34180	0 33860
AGGM4	-0 18437	-0 15246	-0 24397	-0 37935	-0 31713	0 25593	0 16954	0 35122	0 21387	0 30519
AGGM5	-0 17745	-0 18353	-0 15087	-0 27329	-0 26492	0 20406	0 24984	0 35166	0 29262	0 33011
SEMM1	0 14264	0 19504	0 25623	0 17654	0 20025	0 05289	0 07421	0 02258	-0 01298	0 08978
SEMM2	0 11941	0 19071	0 16425	0 18096	0 22323	0 05214	0 09224	-0 04799	-0 02147	-0 00278
SEMM3	0 06373	0 18702	0 11236	0 10968	0 17220	-0 02080	-0 03904	0 06468	0 03983	0 00286
SEMM4	0 12186	0 20945	0 16950	0 17257	0 22849	-0 08828	-0 14099	-0 02021	-0 11748	-0 07187
SEMM5	0 05810	0 15794	0 08806	0 04091	0 13071	-0 02849	-0 11448	0 03991	-0 01541	-0 02400

	AGGM1	AGGM2	AGGM3	AGGM4	AGGM5	SEMM1	SEMM2	SEMM3	SEMM4	SEMM5
SURM1	-0 24461	-0 15281	-0 21237	-0 18437	-0 17745	0 14264	0 11941	0 06373	0 12186	0 05810
SURM2	-0 16976	-0 05073	-0 08765	-0 15246	-0 18353	0 19504	0 19071	0 18702	0 20945	0 15794
SURM3	-0 27165	-0 06226	-0 08892	-0 24397	-0 15087	0 25623	0 16425	0 11236	0 16950	0 08806
SURM4	-0 24610	-0 06130	-0 09897	-0 37935	-0 27329	0 17654	0 18096	0 10968	0 17257	0 04091
SURM5	-0 23854	-0 10469	-0 17183	-0 31713	-0 26492	0 20025	0 22323	0 17220	0 22849	0 13071
SADM1	0 20661	0 15139	0 26503	0 25593	0 20406	0 05289	0 05214	-0 02080	-0 08828	-0 02849
SADM2	0 23723	0 12072	0 21061	0 16954	0 24984	0 07421	0 09224	-0 03904	-0 14099	-0 11448
SADM3	0 28991	0 24605	0 26889	0 35122	0 35166	0 02258	-0 04799	0 06468	-0 02021	0 03991
SADM4	0 18213	0 27401	0 34180	0 21387	0 29262	-0 01298	-0 02147	0 03983	-0 11748	-0 01541
SADM5	0 34739	0 18784	0 33860	0 30519	0 33011	0 08978	-0 00278	0 00286	-0 07187	-0 02400
AGGM1	1 00000	0 19314	0 35218	0 34260	0 37761	0 08146	-0 00955	0 03794	0 00460	0 02962
AGGM2	0 19314	1 00000	0 23685	0 29774	0 34506	0 10041	0 08075	0 22422	0 08028	0 15860
AGGM3	0 35218	0 23685	1 00000	0 25225	0 31444	0 04631	0 01052	0 06157	0 04802	0 08151
AGGM4	0 34260	0 29774	0 25225	1 00000	0 45815	0 05345	-0 02977	0 12030	0 08179	0 15479
AGGM5	0 37761	0 34506	0 31444	0 45815	1 00000	0 07425	-0 05970	0 14382	0 08734	0 14199
SEMM1	0 08146	0 10041	0 04631	0 05345	0 07425	1 00000	0 31978	0 47189	0 50061	0 40959
SEMM2	-0 00955	0 08075	0 01052	-0 02977	-0 05970	0 31978	1 00000	0 41008	0 40654	0 38283
SEMM3	0 03794	0 22422	0 06157	0 12030	0 14382	0 47189	0 41008	1 00000	0 65683	0 63837
SEMM4	0 00460	0 08028	0 04802	0 08179	0 08734	0 50061	0 40654	0 65683	1 00000	0 63988
SEMM5	0 02962	0 15860	0 08151	0 15479	0 14199	0 40959	0 38283	0 63837	0 63988	1 00000

Table D.4

Pearson Correlation Coefficients: Afternoon

	SURA1	SURA2	SURA3	SURA4	SURA5	SADA1	SADA2	SADA3	SADA4	SADA5
SURA1	1.00000	0.66702	0.76580	0.66080	0.62841	-0.08167	-0.22811	-0.17373	-0.12841	-0.42158
SURA2	0.66702	1.00000	0.68884	0.56987	0.63943	-0.04612	-0.24215	-0.18029	-0.15713	-0.37592
SURA3	0.76580	0.68884	1.00000	0.64140	0.70276	-0.04094	-0.18572	-0.11809	-0.14719	-0.36221
SURA4	0.66080	0.56987	0.64140	1.00000	0.55490	-0.05574	-0.19739	-0.13754	-0.19700	-0.32869
SURA5	0.62841	0.63943	0.70276	0.55490	1.00000	-0.10860	-0.28486	-0.22217	-0.28717	-0.46920
SADA1	-0.08167	-0.04612	-0.04094	-0.05574	-0.10860	1.00000	0.46299	0.32793	0.45622	0.29861
SADA2	-0.22811	-0.24215	-0.18572	-0.19739	-0.28486	0.46299	1.00000	0.24389	0.52464	0.48535
SADA3	-0.17373	-0.18029	-0.11809	-0.13754	-0.22217	0.32793	0.24389	1.00000	0.37551	0.42461
SADA4	-0.12841	-0.15713	-0.14719	-0.19700	-0.28717	0.45622	0.52464	0.37551	1.00000	0.41638
SADA5	-0.42158	-0.37592	-0.36221	-0.32869	-0.46920	0.29861	0.48535	0.42461	0.41638	1.00000
AGGA1	-0.48601	-0.40252	-0.45759	-0.49204	-0.34437	0.11461	0.33346	0.22934	0.23979	0.43500
AGGA2	-0.43748	-0.36388	-0.37677	-0.30549	-0.28750	0.05027	0.19548	0.14126	0.16960	0.27621
AGGA3	-0.41515	-0.39908	-0.40367	-0.37335	-0.38385	0.19081	0.33411	0.30715	0.33474	0.52902
AGGA4	-0.41793	-0.42906	-0.43794	-0.41588	-0.39821	0.20223	0.23806	0.28001	0.27823	0.39122
AGGA5	-0.37083	-0.41831	-0.32871	-0.39027	-0.30988	0.15383	0.31069	0.25745	0.24437	0.37058
SEMA1	0.13126	0.20854	0.17753	0.08505	0.21539	-0.01840	-0.09592	0.08547	-0.04157	0.02634
SEMA2	0.18395	0.24932	0.28105	0.13473	0.33038	-0.08937	-0.10816	0.02848	-0.08295	-0.08770
SEMA3	-0.01434	0.05641	0.05940	-0.03402	0.06615	0.00398	-0.01969	0.08874	-0.02915	0.09325
SEMA4	0.05387	0.10820	0.14865	-0.00986	0.18454	-0.05102	-0.04536	0.02967	-0.04284	-0.00753
SEMA5	0.02130	0.09151	0.05196	-0.06144	0.09823	-0.03390	-0.05432	0.09354	-0.05343	0.00089

	AGGA1	AGGA2	AGGA3	AGGA4	AGGA5	SEMA1	SEMA2	SEMA3	SEMA4	SEMA5
SURA1	-0.48601	-0.43748	-0.41515	-0.41793	-0.37083	0.13126	0.18395	-0.01434	0.05387	0.02130
SURA2	-0.40252	-0.36388	-0.39908	-0.42906	-0.41831	0.20854	0.24932	0.05641	0.10820	0.09151
SURA3	-0.45759	-0.37677	-0.40367	-0.43794	-0.32871	0.17753	0.28105	0.05940	0.14865	0.05196
SURA4	-0.49204	-0.30549	-0.37335	-0.41588	-0.39027	0.08505	0.13473	-0.03402	-0.00986	-0.06144
SURA5	-0.34437	-0.28750	-0.38385	-0.39821	-0.30988	0.21539	0.33038	0.06615	0.18454	0.09823
SADA1	0.11461	0.05027	0.19081	0.20223	0.15383	-0.01840	-0.08937	0.00398	-0.05102	-0.03390
SADA2	0.33346	0.19548	0.33411	0.23806	0.31069	-0.09592	-0.10816	-0.01969	-0.04536	-0.05432
SADA3	0.22934	0.14126	0.30715	0.28001	0.25745	0.08547	0.02848	0.08874	0.02967	0.09354
SADA4	0.23979	0.16960	0.33474	0.27823	0.24437	-0.04157	-0.08295	-0.02915	-0.04284	-0.05343
SADA5	0.43500	0.27621	0.52902	0.39122	0.37058	0.02634	-0.08770	0.09325	-0.00753	0.00089
AGGA1	1.00000	0.54751	0.54564	0.51434	0.58288	0.10368	-0.00878	0.21472	0.20640	0.21849
AGGA2	0.54751	1.00000	0.44812	0.45088	0.53419	0.08173	-0.02057	0.27554	0.17816	0.16793
AGGA3	0.54564	0.44812	1.00000	0.50908	0.56152	0.11984	-0.04953	0.22795	0.12502	0.17400
AGGA4	0.51434	0.45088	0.50908	1.00000	0.63823	0.12904	-0.09848	0.23871	0.19088	0.25088
AGGA5	0.58288	0.53419	0.56152	0.63823	1.00000	0.18323	0.02403	0.32985	0.22815	0.27306
SEMA1	0.10368	0.08173	0.11984	0.12904	0.18323	1.00000	0.37888	0.57853	0.58883	0.54179
SEMA2	-0.00878	-0.02057	-0.04953	-0.09848	0.02403	0.37888	1.00000	0.34132	0.45088	0.38088
SEMA3	0.21472	0.27554	0.22795	0.23871	0.32985	0.57853	0.34132	1.00000	0.64572	0.62888
SEMA4	0.20640	0.17816	0.12502	0.19088	0.22815	0.58883	0.45088	0.64572	1.00000	0.71106
SEMA5	0.21849	0.16793	0.17400	0.25088	0.27306	0.54179	0.38088	0.62888	0.71106	1.00000

APPENDIX E

SCORING SHEETS AND
TEACHER-INSTRUCTION FORMS

Name: Grade: Age: Boy or Girl (CIRCLE ONE)

RIGHT NOW I FEEL

School:
Weather:
Time:

INSTRUCTIONS: Here are some statements which are often used to describe feelings. Please read each statement carefully, and show how you feel by drawing a line from the centre word to the size of circle which best describes how you feel right now.

EXAMPLE
ACETATE SCORER

PAMS

EXAMPLES:

RIGHT NOW I FEEL
not at all · a little
CO-OPERATIVE
a lot · somewhat

RIGHT NOW I FEEL
somewhat · a lot
HELPFUL
a little · not at all

(right now I feel)

1. a
RIGHT NOW I FEEL
1 · 0
BAD-TEMPERED
2 · 3

5. a
RIGHT NOW I FEEL
0 · 1
FURIOUS
3 · 2

2. a
RIGHT NOW I FEEL
0 · 3
BOSSY
1 · 2

6. s
RIGHT NOW I FEEL
1 · 2
GLAD
0 · 3

3. sm
RIGHT NOW I FEEL
2 · 1
BRAVE
3 · 0

7. sm
RIGHT NOW I FEEL
2 · 3
HANDSOME (OR) PRETTY
1 · 0

4. s
RIGHT NOW I FEEL
3 · 2
CHEERFUL
0 · 1

8. s
RIGHT NOW I FEEL
3 · 0
JOYFUL
2 · 1

please turn over....

9. a

RIGHT NOW I FEEL

1 0

LIKE HITTING

2 3

10. s

RIGHT NOW I FEEL

2 1

LIKE SMILING

3 0

11. s d

RIGHT NOW I FEEL

3 2

LONELY

0 1

12. a

RIGHT NOW I FEEL

0 3

MEAN

1 2

13. s m

RIGHT NOW I FEEL

1 2

POWERFUL

0 3

14. s d

RIGHT NOW I FEEL

2 3

SAD

1 0

15. s m

RIGHT NOW I FEEL

3 0

STRONG

2 1

16. s m

RIGHT NOW I FEEL

0 1

TOUGH

3 2

17. s d

RIGHT NOW I FEEL

1 0

TRAPPED

2 3

18. s d

RIGHT NOW I FEEL

2 3

UNWANTED

1 0

19. s d

RIGHT NOW I FEEL

0 1

UPSET

3 2

20. s

RIGHT NOW I FEEL

3 2

WONDERFUL

0 1

PAMS SCORING SHEET

Name:

Age:

Grade:

	Item #	Scale: SURGENCY	SADNESS	AGGRESSION	MASTERY/SELF-ESTEEM
Bad-tempered	1.	■	■		■
Bossy	2.	■	■		■
Brave	3.	■	■	■	
Cheerful	4.		■	■	■
Furious	5.	■	■		■
Glad	6.		■	■	■
Handsome (or) Pretty	7.	■	■	■	
Joyful	8.		■	■	■
Like Hitting	9.	■	■		■
Like Smiling	10.		■	■	■
Lonely	11.	■		■	■
Mean	12.	■	■		■
Powerful	13.	■	■	■	
Sad	14.	■		■	■
Strong	15.	■	■	■	
Tough	16.	■	■	■	
Trapped	17.	■		■	■
Unwanted	18.	■		■	■
Upset	19.	■		■	■
Wonderful	20.		■	■	■
		TOTAL: S	SD	A	SM

DEPARTMENT OF PSYCHOLOGY

THE UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA
T6G 2E9

Edmonton Sample: Teacher-Instruction Form A

Dear

Please find enclosed copies of the Right Now I Feel questionnaire. As mentioned before, all students who participated in the testing during November and December may again do so, therefore enough copies of the new measure are provided for two sittings.

After speaking with the principals regarding testing just prior to a "neutral activity" , it was decided that an in-school/in-classroom movie or film would be a better choice than would be testing just prior to a field trip. The most "apprehensive activity" for school children is, of course, believed to be a classroom exam, and thus, we wish to also test just prior to that event.

In order to validate the instrument we need to counterbalance for "practice effect" on the measure, so half of the school sample will take the questionnaire just prior to an exam, and then again just prior to a movie; the remaining children in the sample will take the questionnaire in the reverse order (i.e., first, prior to a movie, and second, prior to an exam). We would like you to give the Right Now I Feel form in the following order:

1. Immediately before the next major EXAM in your class

and 2. On a subsequent day, immediately before the next-scheduled FILM is shown

Because the measure is self-explanatory, there should be no problem in merely passing out the form, and asking the pupils to read the instructions and follow the examples. However, it is very important that the descriptive information at the top of the questionnaire (Name, Grade, Age, Boy or Girl) be complete, since we need all of these data in order to do a proper analysis.

Once again, thank you for your cooperation in this endeavor. We will be out to your school during the first week of June in order to gather the completed measures and finalize the results before the end of the school year. If a summary of the research is desired, please check the appropriate box(es) below.

Please Fill In The Relevant Information For Each Testing

EXAM (given first)	FILM (given second)
date of testing:	date of testing:
day of week:	day of week:
time of day:	time of day:
weather: bright and sunny___	weather: bright and sunny___
dreary ___	dreary ___
rainy ___	rainy ___
type of test: math ___	type of Film:
science___	
spelling___	
other__________	
Are any unusual activities planned for later in the day, and if so, what?	Are the children held responsible for the movie's content on an exam ?

I would like a separate analysis of my class Yes___ No___

I would like a separate analysis of my school Yes___ No___

I would like a summary of the overall test results Yes___ No___

If you have any further questions regarding this research please contact me at 432-5274 (days) and 462-0094 (evenings).

Kar-La' Schokman-Gates

DEPARTMENT OF PSYCHOLOGY

THE UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA
T6G 2E9

Edmonton Sample: Teacher-Instruction Form B

Dear

Please find enclosed copies of the Right Now I Feel questionnaire. As mentioned before, all students who participated in the testing during November and December may again do so, therefore enough copies of the new measure are provided for two sittings.

After speaking with the principals regarding testing just prior to a "neutral activity", it was decided that an in-school/in-classroom movie or film would be a better choice than would be testing just prior to a field trip. The most "apprehensive activity" for school children is, of course, believed to be a classroom exam, and thus, we wish to also test just prior to that event.

In order to validate the instrument we need to counterbalance for "practice effect" on the measure, so half of the school sample will take the questionnaire just prior to an exam, and then again just prior to a movie; the remaining children in the sample will take the questionnaire in the reverse order (i.e., first, prior to a movie, and second, prior to an exam). We would like you to give the Right Now I Feel form in the following order:

1. Immediately before the next-scheduled **FILM** is shown

and 2. On a subsequent day, immediately before the next major **EXAM** in your class

Because the measure is self-explanatory, there should be no problem in merely passing out the form, and asking the pupils to read the instructions and follow the examples. However, it is very important that the descriptive information at the top of the questionnaire (Name, Grade, Age, Boy or Girl) be complete, since we need all of these data in order to do a proper analysis.

Once again, thank you for your cooperation in this endeavor. We will be out to your school during the first week of June in order to gather the completed measures and finalize the results before the end of the school year. If a summary of the research is desired, please check the appropriate box(es) below.

Please Fill In The Relevant Information For Each Testing

FILM (given first)	EXAM (given second)
date of testing:	date of testing:
day of week:	day of week:
time of day:	time of day:
weather: bright & sunny___	weather: bright & sunny___
dreary ___	dreary ___
rainy ___	rainy ___
type of film:	type of test: math ___
	science ___
	spelling ___
	other___________
Are the children held responsible for the movie's content on an exam?	Are any unusual activities planned for later in the day, and if so, what?

I would like a separate analysis of my class Yes___ No___

I would like a separate analysis of my school Yes___ No___

I would like a summary of the overall test results Yes___ No___

If you have any further questions regarding this research please contact me at 432-5274 (days) and 462-0094 (evenings).

Kar-Le' Schokman-Gates

Wetaskiwin Sample: Teacher-Instruction Form

DEPARTMENT OF PSYCHOLOGY

THE UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA
T6G 2E9

May 6, 1983

Dear Teachers:

As part of the ongoing research being conducted by Alberta Education, we are asking that you administer the following questionnaire ("Right Now I Feel") to your pupils on Monday, May 9th. For research purposes it is necessary that the measure be given twice on that day: 1) First thing in the morning, before any other classroom activity, and 2)at the beginning of the last hour, at approximately 2:30 P. M.; it is very important that these testing times be adhered to since they will assure comparability in conditions across the different classes . Also, it would be appreciated if any scheduled classroom exam could be given at least ½ hour before or after the research measure since apprehension regarding a test has been found to affect the pupils' responses to this measure.

Because the questionnaire is self-explanatory, there should be no problem in merely passing out the form, and asking the children to read the instructions and follow the examples. However, it is very important that the descriptive information at the top of the questionnaire (Name, Grade, Age, Boy or Girl, School, Weather, & Time) be complete, since we need all of these data in order to do a proper analysis. You may use your school code # to identify your class, and the terms "sunny", "dreary", or "rainy" to describe the weather. Time may likewise be encoded as "1" for "first thing in the morning" and "2" for "beginning of the last hour". Please keep the morning measure separated from the afternoon by placing a rubber band around each group of questionnaires.

A few of the classes are also being asked to administer the SEI form immediately after the afternoon questionnaire. Again, it is important that the child's name, age, and school be identified on the SEI, and that the completed forms be kept together by a rubber band.

Total time should be around 5 minutes for each questionnaire testing, while the SEI will add an extra 10 minutes for those classes who are using it.

Thank you very much for your cooperation in this endeavor.

Kar-La' Schokman-Gates
Psychologist
University of Alberta

APPENDIX F

WETASKIWIN

LIGHT AND COLOR INFORMATION

Note. From Effects of Color and Light on the Development of Elementary School Pupils, by H. Wohlfarth, Alberta Education Ministry, Research and Planning Grant, 1982-1984. Reprinted by permission.

Selection of Colors

Colorpsychodynamic Environment Design for Experimental School No. 1 (Norwood) and No. 3 (McMurdo)

Objectives and Design

Dr. H. Ertel of the Gesellschaft fuer Rationale Psychologie, Munich, found in his study "Kinder-Farbstudie" (1978), that the IQ as well as academic achievement of children could be significantly improved by using bright, warm colors in the classrooms. The objectives underlying the selection of colors for the two schools with a total colorpsychodynamic environment were based: a) on the phenomenological and psychological character of colors according to Max Luescher[*]; b) on the empiric findings of Wohlfarth and Sam as the result of their 1981 research project.[**] The objectives were also twofold: 1) to stimulate the students toward higher achievement and performance, 2) to counteract "Teacher burnout". In order to achieve the two objectives, basically two "main" colors were selected. A warm, light yellow (73-85, Glidden) was used on the three walls the students were facing, and light warm blue (77-30 Glidden) was used for the wall and the vertical surfaces of student desks the teachers were facing during the school day. All "blackboards" were changed from green to blue (77-18 Glidden). The "special education" classrooms were designed in light warm yellow to stimulate the slow students and in light warm blue for the hyper-active students. All carpets in classrooms and offices were in a warm golden-grey (78-69 Glidden). The colors of the control school were Dark Brown (79-88 Glidden), Grey (78-79 Glidden), Off-White (71-15 Glidden), Putty (73-19 Glidden) and orange (72-56 Glidden). The reason for using the Glidden Computer Numbers was the availability of Glidden colors (paints) in both Canada and the U.S.A.

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[*] Luescher, M.: "Psychologie der Farben", Testverlag, Basel, 1949

[**] H. Wohlfarth and C. Sam: "Effects of Color/Light Changes on Severely Handicapped Children", Alberta Education, 1981.

Green Bell and Boyer[*] reported in their paper "Coloring the environment: Hue, arousal, and boredom" that one hundred and forty undergraduate subjects, sitting in carrels having side panels painted either light blue, blue, pink, red, orange, white, brown, yellow, green or grey were exposed to procedures designed to induce boredom. Subjects listened to a tape that repeated one of two words every 2 seconds for 10 minutes. The results showed that self-reported arousal and evaluations of the environment were higher in the yellow condition than in the other color conditions. Response to boredom-induction procedures did not vary with color or saturation." This strong stimulating effect of yellow is in keeping with Wohlfarth's observations in his research into the effect of calibrated color stimuli upon the autonomic nervous system carried out in the late 1950's and his observations in the project: "The effect of colorvisualisation in a alpharhythm state upon the healing time of artifically induced epidermal wounds". It is only regrettable, that Greene et. al. did not give a Glidden Color Computer Number or a Munsel color coordinate to make it possible for other researchers to know exactly what color (hue, tone, tint) was used in their experiments.

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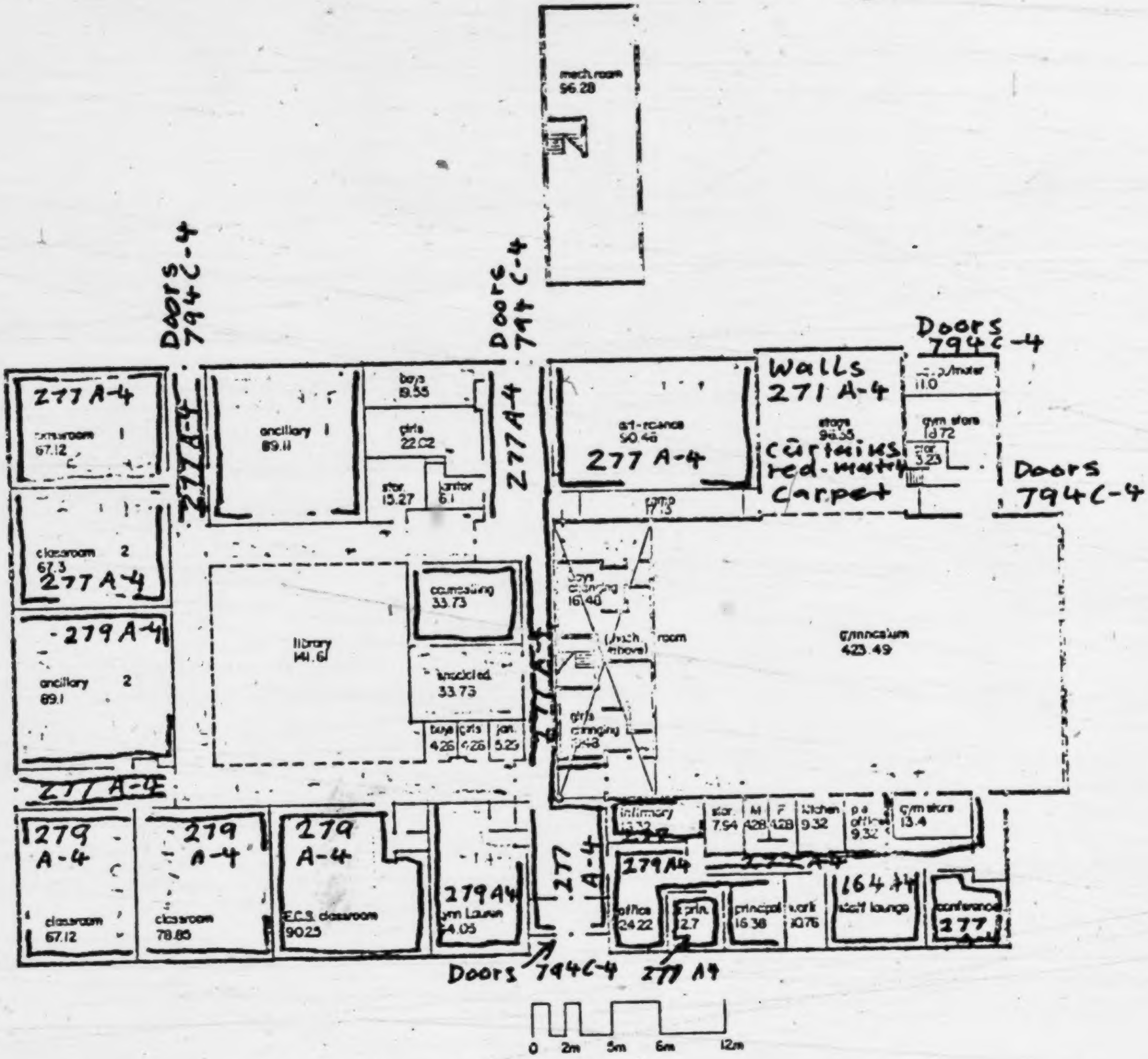
[*] T.C. Greene, P. A. Bell and W.N. Boyer, "Coloring the Environment: Hue, arousal and bordeom." Bulletin of the Psychonomic Society 1983, 21 (4) 253-54.


mech room
56.28
Doors 794 C-4
Doors 794 C-4
277 A-4
classroom 1
67.12
277 A-4
ancillary 1
89.11
boys
19.55
girls
22.02
stor.
15.27
janitor
6.1
277 A-4
art-science
50.46
277 A-4
Walls
271 A-4
stage
96.55
Curtains
red-musty
Carpet
Doors
794 C-4
11.0
gym store
10.72
stor.
3.23
Doors
794 C-4
ramp
17.5
classroom 2
67.3
277 A-4
library
141.61
counselling
33.73
33.73
boys
4.26
girls
4.26
jan.
5.25
boys
changing
16.40
(mech. room above)
girls
changing
gymnasium
423.49
279 A-4
ancillary 2
89.1
277 A-4
279
A-4
classroom
67.12
279
A-4
classroom
78.85
279
A-4
E.C.S. classroom
90.25
279 A4
gym Lounge
4.05
277
A-4
infirmary
13.32
stor.
7.54
M
4.28
F
4.28
kitchen
9.32
p.a.
office
9.32
gym store
13.4
279 A4
office
24.22
prin.
2.7
principal
16.38
work
10.76
164 A4
staff lounge
conference
277
Doors 794 C-4
277 A4
0
2m
5m
6m
12m

NORWOOD ELEMENTARY 6x6
COMMUNITY CORE SCHOOL FOR
SCHOOL DISTRICT 264
WETASKIWIN

gross total area
(including mechanical room)
2369.08 sq meters

ALL yellow Walls:

277 A-4
+ 279 A-4 = 2972-7 Bapco

ALL blue Walls:

638 A-4
+ 639 A-4 = 3937-7 Bapco

164 A-4" = 2632-7 Bapco

271 A-4 = 3184-7 Bapco

WETASKIWIN SCHOOL DISTRICT NO 264

PARKDALE ELEMENTARY SCHOOL

School Buildings Branch

Date JULY 24/'74 | Drawn By T.L. | Scale 1/20 - 1'-0"

FLOOR PLAN

CODE 3142

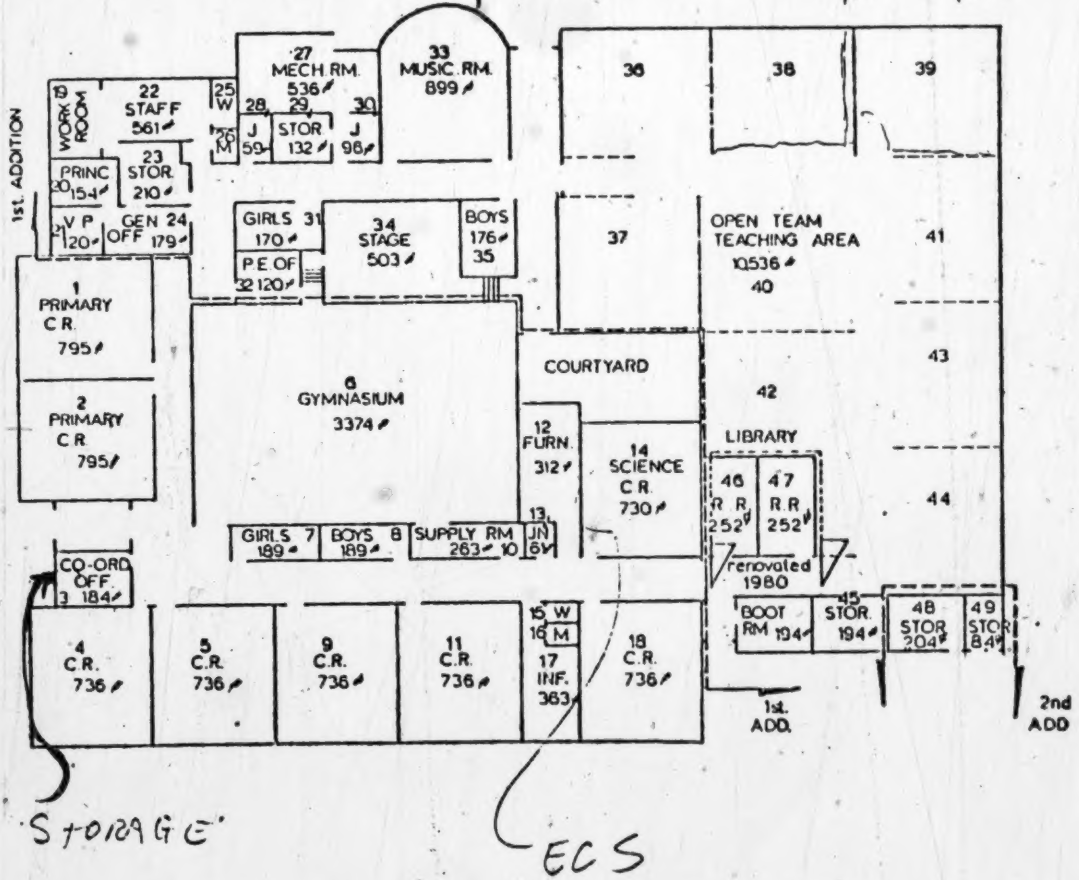
Sheet 2/2

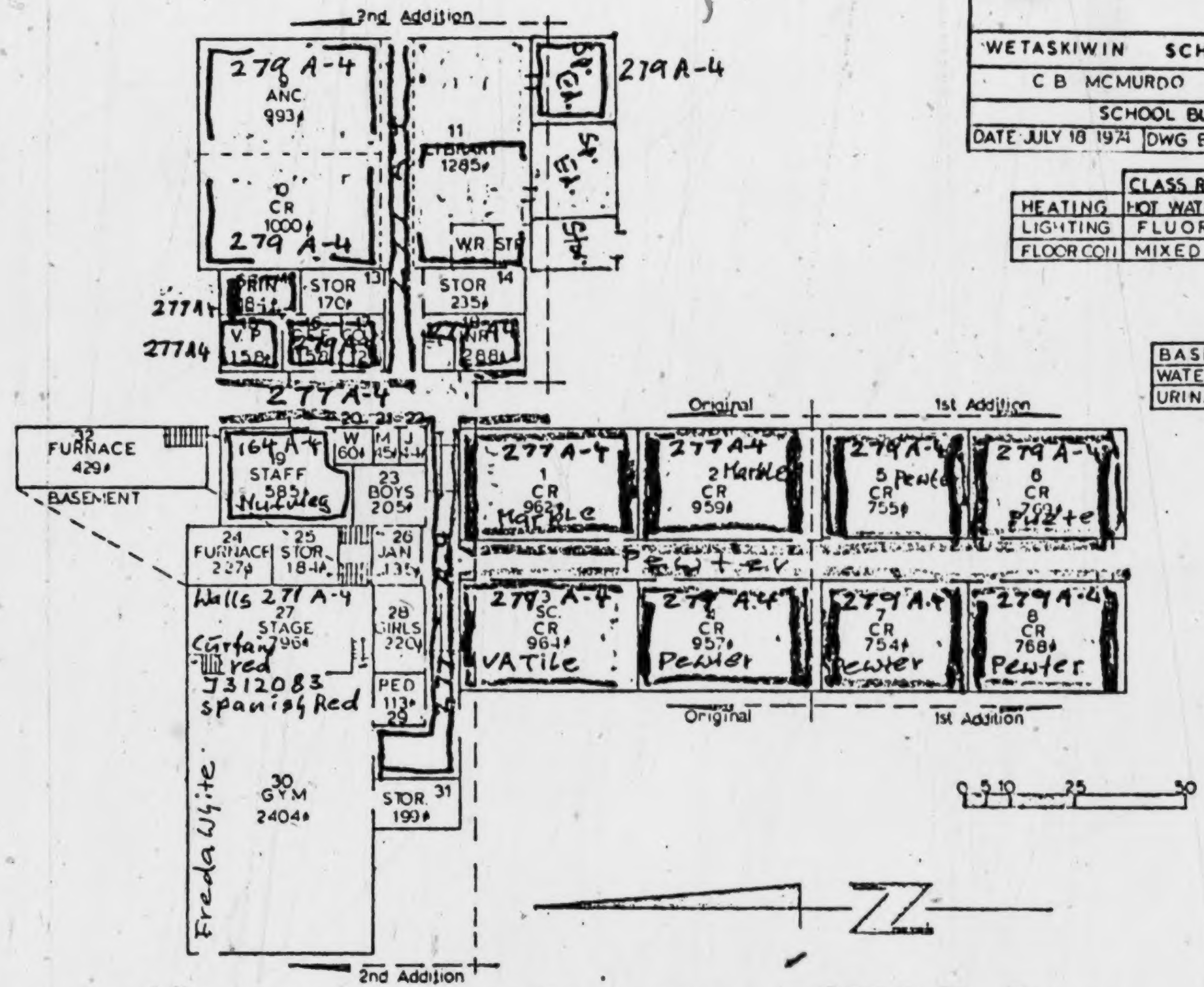
SCHOOL DATA

ORIGINAL — 1961 — MASONRY — 14584 ⌀ — PLAN NO 3721
1st ADD — 1969 — MASONRY — 17,193 ⌀ — 4848
2nd ADD — 1980 — MASONRY — 323 ⌀ — 5847

	CLASSRM	GYM	HALL
HEATING	HOT AIR	HOT AIR	HOT AIR
LIGHTING	FLUOR	FLUOR	FLUOR
FLOOR CONT	SLAB	SLAB	SLAB

WASHROOMS	BOYS	GIRLS
BASINS	6	5
WATER CL.	5	8
URINALS	8	


1st. ADDITION
19 WORK ROOM
22 STAFF 561
25 W
26 M
27 MECH RM. 536
28 J 59
29 STOR 132
30 J 96
33 MUSIC RM. 899
36
38
39
20 PRINC 154
23 STOR. 210
21 V P 120
GEN OFF 24 179
GIRLS 31 170
32 P.E. OF 120
34 STAGE 503
BOYS 176 35
37
OPEN TEAM TEACHING AREA 10536 40
41
1 PRIMARY C R. 795
2 PRIMARY C R. 795
6 GYMNASIUM 3374
COURTYARD
42
43
44
12 FURN. 312
14 SCIENCE C.R. 730
LIBRARY
46 R.R. 252
47 R.R. 252
GIRLS 7 189
BOYS 8 189
SUPPLY RM 263 10
13 JN 61
renovated 1980
CO-ORD OFF. 3 184
4 C.R. 736
5 C.R. 736
9 C.R. 736
11 C.R. 736
15 W
16 M
17 INF. 363
18 C.R. 736
BOOT RM 194
45 STOR. 194
48 STOR 204
49 STOR 84
1st. ADD.
2nd ADD
N
0 5 10 25 50
STORAGE
ECS


2nd Addition
279 A-4
9
ANC.
993
10
CR
1000
279 A-4
11
LIBRARY
1285
WR
STR
STOR
13
170
STOR
14
235
PRIN
V.P
158
277A4
277A4
277 A-4
279 A-4
NR
288
20
21
22
W
60
M
J
164 A-4
19
STAFF
585
Nutmeg
23
BOYS
205
32
FURNACE
429
BASEMENT
24
FURNACE
227
25
STOR.
184
26
JAN
135
Walls 271 A-4
27
STAGE
796
Curtain red
J312083
spanish Red
28
GIRLS
220
PED
113
29
30
GYM
2404
STOR.
31
199
FredaWhite
Original
1st Addition
277 A-4
1
CR
962
Marble
277 A-4
2 Marble
CR
959
279 A-4
5 Pewter
CR
755
279 A-4
6
CR
769
Pewter
Pewter
279 A-4
3
SC.
CR
964
VATile
279 A-4
4
CR
957
Pewter
279 A-4
7
CR
754
Pewter
279 A-4
8
CR
768
Pewter
Original
1st Addition
2nd Addition
0 5 10 25 50

SCHOOL DATA

WETASKIWIN SCHOOL DISTRICT NO 284	
C B MCMURDO ELEMENTARY	
SCHOOL BUILDING BRANCH	
DATE JULY 18 1974	DWG BY FU
SCALE 1" = 20'	

	CLASS RM	GYM	HALL
HEATING	HOT WATER	FORCED AIR	MIXED
LIGHTING	FLUOR	FLUOR	MIXED
FLOOR CON	MIXED	SLAB	MIXED

	BOYS	GIRLS
BASINS	4	4
WATER CLT	2	5
URINALS	4	—

ALL yellow Walls: 277A-4 + 279A-4 = 2972-7 Bapco

ALL blue Walls: 638A-4 + 639A-4 = 3937-7 Bapco

EXPERIMENTAL SCHOOL

(Norwood)

WALLS

Paint: Bapco

Doors - Leading Outside = 4600-5

Doors on Yellow Walls = 2976-8

Doors on Blue Walls = 3837-9

Doors 638, 639, 640, 641 = 777 R-4

Walls

Yellow Walls	Blue Walls
Classroom 1 = 2972-7	3937-7
Classroom 2 = 2972-7	3937-7
Classroom 3 = 2972-7	3937-7
Classroom 4 = 2972-7	3937-7
Art/Science = 2972-7	3937-7
Auxiliary 1 = 2972-7	3937-7
Auxiliary 2 = 2972-7	3937-7
Special Ed. 1 = 2972-7	Special Ed. 2 = 3937-7
E.C.S. Classroom = 2972-7	
Lynn Lauren = 2972-7	3937-7
Office = 2972-7	Washrooms and Change = 3937-7
Infirmary = 2972-7	3937-7
Principal = 2972-7	3937-7
Conference = 2972-7	
P.E. Office = 2972-7	3937-7
Halls = 2972-7	
Vice-Principal = 2972-7	
Staff Lounge = 2632-7	window wall = 3184-7
Stage = 3184-7	

All Code NOS.
are: CIL
(Bapco)

Vinyl Walls

Library = Westroc, coarse suede - cobalt

EXPERIMENTAL SCHOOL

(Norwood)

FLOORCOVERING

Carpets: Mandate
Vice Principal and Principal = J31206, Nutmeg and Conference

Office = J31208, Spanish Red

Staff Lounge = J31206, Nutmeg

Classrooms = 1, 2, J31203, Marble,
Auxiliary 2,3,4,
Auxiliary 1, = J31202, Pewter

Stage = J31208, Spanish Red

ECS Classroom = J31206, Nutmeg

Special Ed. 1 = J31208, Spanish Red

Special Ed. 2 = J31202, Pewter

Library = J31202, Pewter

Column in Entry I = J31203, Marble

Ramp = J31202, Pewter

Quarry Tile = 7800, Colonial Falsh (Gail Ceramics)

V.A. Tile: EGS Classroom = AVP 99 Blue

V.A. Tile: Lynn Lauren C/R = AVP 99 Blue

V.A. Tile = Art and Science = ACT-1046 Sand

Infirmary, V.A. Tile = ACT-1047 Ginger

P.E. Office, V.A. Tile = ACT-1060 Orange Flame

EXPERIMENTAL SCHOOL

(Norwood)

FIXTURES

Units: 1,2,3,4,5,6, -9,10,11,12,-16, Horizontal = Formica, Camelot Blue = 842, FDL65

Units: 7,8,13,15,17, Horizontal = Formica, Bright Kumquat = 848,FDL65

Units: 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20, Vertical = Formica, Antique White = 489, FIN65

EXPERIMENTAL SCHOOL

(Norwood)

CHALKBOARDS AND TACKBOARDS

A = Blackboard and tackboard

B = Blackboard

C = Smaller Blackboard and Tackboard

D = Blackboard

E = Tackboard

ALL Chalkboards: Alliance Wall, Blue No. 807

Tackboards:

Classroom 1, E opposite A = 9-01 Columbia Blue
Classroom 2, E opposite A = 9-01 Columbia Blue
Auxiliary 2, E opposite A = 9-01 Columbia Blue
Classroom 3, E opposite A = 9-01 Columbia Blue
Classroom 4, E opposite A = 9-01 Columbia Blue
Auxiliary 1, E opposite A = 9-01 Columbia Blue
Special Ed. 2, both E = 9-01 Columbia Blue

All other Tackboards including the ones on the A and C combinations: LF-110, yellow Bouquet

*The light change was made by replacing the cool white flourescent tubes in the classroom with full spectrum vitalite. This full spectrum light comes relatively close to natural daylight, as can be seen in the spectrum graphs on the right.

Source: Duro-Test Electric, Ltd., Montreal, Que.